

# **Attachment E**

## **Environmental Sustainability Progress Report**



# Green Smart Connected

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## Since 2008, Sustainable Sydney 2030 has articulated the collective vision of residents and visitors, workers and businesses. The City then committed to ambitious targets and strong actions across six key environmental focus areas, set out in the Environmental Action 2016-2021 Strategy and Action Plan

The Green Report outlines the progress of our environmental program. The Green Report is the City's state of the environment report and fulfils the reporting requirements of the NSW Local Government Act 1993 No. 30 Section 428A and the Integrated Planning and Reporting guidelines.

The City's Environment Policy<sup>1</sup> applies to all City of Sydney's operations, assets, activities and staff.

An Environmental Management System (EMS) supports the City's commitment to sustainable asset management and operations.

### Message from the CEO

In June, we declared that climate change poses a serious risk and should be treated as a national emergency. More than 600 jurisdictions in 13 countries – including ourselves – have now declared a climate emergency, according to the International Climate Emergency Forum.

The Climate Emergency Declaration campaign in Australia is supported by over 50 climate action groups, including the International Climate Emergency Forum, Extinction Rebellion, and Greenpeace Australia.

The City continues to strengthen its commitment as an environmental leader and the climate emergency declaration is in line with the City's commitment to strong action on climate change.

This Green Report provides an update for the most recent period, January to July 2019 on our programs, initiatives and achievements.

Highlights include the Green Square town centre being awarded a 6 Star Green Star – Communities rating from the Green Building Council of Australia. Six stars is the highest possible rating, denoting 'world leadership' in the areas of governance, liveability, economic prosperity, environment and innovation. In June, over 50 leading companies joined the City in pledging to dramatically reduce plastics across their businesses. The City has taken a platinum pledge, committing to phasing out seven single-use items in its buildings, at its own venues and at events within our local government area. Business can continue to pledge and the form is available [online](#).

I encourage everyone to read and distribute this report widely to share ideas and inspire environmental leadership everywhere.



Monica Barone, Chief Executive Officer

<sup>1</sup> City of Sydney Environment Policy can be seen in Appendix 2.

# 1. Our environmental targets

**Sustainable Sydney 2030 outlines the aspiration of our community and businesses for our local government area to be an environmental leader on a global scale.**

The following are environmental targets outlined in the Environmental Action 2016 - 2021 Strategy and Action Plan.

## City of Sydney Operations



### Low-carbon city

- **44** per cent reduction in greenhouse gas emissions by end June 2021 based on 2006 levels
- **70** per cent reduction in emissions by 2030 based on 2006 levels
- **50** per cent of electricity from renewable sources by end June 2021



### Water sensitive city

- Annual potable water use of **180** L/m<sup>2</sup> of irrigated open space by end June 2021
- **Zero** increase in potable water use by end June 2021 from 2006 baseline, achieved through water efficiency and recycled water
- **Zero** increase in potable water use by 2030 from 2006 baseline, achieved through water efficiency and recycled water



### Zero waste city

- **70** per cent resource recovery of waste from City-managed properties by end June 2021
- **80** per cent resource recovery of construction and demolition waste generated and managed by City operations by end June 2021
- **50** per cent resource recovery of waste from City parks, streets and public places by end June 2021



### Active and connected city

- **Zero** increase in fleet emissions from 2014 baseline by end June 2021



### Green and cool city

- The average total canopy cover is increased by **50** per cent by 2030 (from 15 to 23 per cent), and increased by **75** per cent by 2050 (to 27 per cent), from a 2008 baseline
- Plant **700** new street trees each year until 2021
- Plant **50,000** new trees and shrubs in City parks and street gardens each year until 2021
- Tree species diversity will not consist of more than **40** per cent for any particular plant family, **30** per cent for any genus or **10** per cent for any one species by 2021
- Habitat sites in the city are protected and the area of bush restoration sites is increased by **100** per cent by 2023 from a 2012 baseline of 4.2 hectares
- Indigenous fauna species diversity, abundance and distribution is **maintained or increased** by 2023 based on a 2012 baseline
- A progressive **increase** in the number of habitat features for priority fauna species is established along potential habitat linkages by 2023



### Local Government Area

Since the targets for Sustainable Sydney 2030 were set, the City of Sydney local government area (LGA) has undergone significant growth and is expected to continue to grow.

Regardless of future growth, the 2030 targets set by the City of Sydney are absolute.



#### Low-carbon city

- **70** per cent reduction in greenhouse gas emissions by 2030 based on 2006 levels
- Net **zero** emissions by 2050
- **50** per cent of electricity demand met by renewable sources by 2030



#### Water sensitive city

- **Zero** increase in potable water use by 2030 from 2006 baseline, achieved through water efficiency and recycled water
- **50** per cent reduction in the annual solid pollution load discharged to waterways via stormwater by 2030
- **15** per cent reduction in annual nutrient load discharged to waterways via stormwater by 2030



#### Zero waste city

- **70** per cent recycling and recovery of residential waste from the local government area by end June 2021
- **70** per cent recycling and recovery of commercial and industrial waste from the local government area by end June 2021
- **80** per cent recycling and recovery of construction and demolition waste from the city by end June 2021



#### Active and connected city

- **33** per cent of trips to work during the AM peak undertaken by walking by 2030, by city residents
- **10** per cent of total trips made in the city are undertaken by bicycle by 2030
- **80** per cent of trips to work during the AM peak are undertaken by public transport by 2030, by city residents and those travelling to Central Sydney from elsewhere
- **30** per cent of city residents who drive (with an unrestricted drivers licence) are members of a car sharing scheme by 2030



#### Green and cool city

- The average total canopy cover is increased by **50** per cent by 2030 (from 15 to 23 per cent), and increased by **75** per cent by 2050 (to 27 per cent), from a 2008 baseline

# 2. Highlights

## Local Government Area

### Low Carbon City



### Water Sensitive City



### Active and Connected City



### Zero Waste City



## City of Sydney Operations

### Low Carbon City



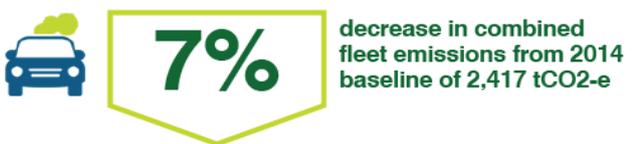
### Water Sensitive City



### Solar Power



### Fleet Emissions



### Carbon Neutral



### Green and Cool City



### Zero Waste City



# Delivering to the community

## Better Buildings Partnership



**59%**

Commercial office space in Sydney CBD in partnership



**51%**

GHG emissions reduction (from FY06)



**77**

buildings with carbon neutral commitments



**31%**

reduction in potable water use (from FY06)

(FY 2018 program performance)

## Sustainable Destination Partnership



**40**

Program launched in June 2018 with 40 members from the entertainment and accommodation sector



**48%**

hotel rooms in Sydney involved in program

## CitySwitch Green Office



**21%**

commercial office space in Sydney CBD committed to program



**36,310**  
tonnes CO2-e

GHG emissions reduction in 2018



**10**

CitySwitch Sydney members are carbon neutral

(FY 2018 program performance)

## Smart Green Apartments



**133**

apartment buildings in the program.



**30%**

opportunities to reduce GHG emissions

**50**

NABERS ratings for apartment buildings

(Program achievements to Jun 2019)



**211** ML

potable water saved per year

## Number of environmental performance grants

**1**

Matching grants

**51**

Environmental performance grants

**1**

Knowledge exchange sponsorship

(Grants approved Jan-Jun 2019)



# 3. Sustainability at the City

## Delivering Best Practice Sustainable Events

The City delivers and manages some of the largest events in Sydney. Events, like New Year's Eve, are watched by billions of people from around the globe. We acknowledge that these events, large and small, can have a significant environmental impact and that we must carefully manage water and energy use, waste generation, event activities like fireworks and the transport of goods and people .

We also recognise that we have an important role to play as environmental leaders for local governments and communities worldwide. This is why we have started the journey to manage our local events to the best practice standard ISO20121 Sustainable Event Management.

One of the most effective ways to influence positive change in managing events is to engage with our product and service providers, and share with them our goals and values. The City's Major Events and Festivals team have already achieved significant, positive impacts via this approach. For example, at the City's request, the contracted fireworks operator, Foti International Fireworks, transitioned to reusable drinking bottles and dispensers during its operations for Sydney New Year's Eve 2018. A reduction of 4,000 single use plastic bottles resulted, demonstrating the impact that one supplier can have on an event. There are more success stories like this in the Zero Waste city section of this report.

The City's Major Events and Festivals team continues to work with suppliers and the community to achieve sustainability best practice, with an initial focus on New Year's Eve and the Lord Mayor's Picnic. In this way the City retains its leadership role in commitment to environmental performance, delivering sustainable events that seek to minimise waste, maximise waste recovery and carefully manage energy requirements, in order to reduce our carbon footprint. These actions demonstrate a shift in the City's focus from delivering "the biggest" new year's eve event to delivering the most sustainable event of its kind.



## Sydney Gay and Lesbian Mardi Gras is carbon neutral and single use plastic free

For the first time, Sydney Gay and Lesbian Mardi Gras largest events were 100 per cent carbon-offset in 2019. A new partnership with Powershop ensures that Mardi Gras achieves certification against the Australian Government's National Carbon Offset Standard (NCOS), and means that the carbon footprint of the festival's three largest events; Fair Day, Party and the Mardi Gras Parade is reduced. The plan is for the entire event to be carbon neutral within five years.

Mardi Gras Arts CEO, Terese Casu said, "Sydney Gay and Lesbian Mardi Gras has always been a leader in the issues that matter the most to the community so going carbon neutral was a natural fit."

Event organisers also followed an increasing, international movement to phase out single-use items including glitter, balloons and single-use plastic water bottles . Production teams also made parade floats shine and sparkle with lanterns and fluorescent lights, as well as re-used props from old parades.



# 4. Low Carbon City



## What our cities do to address climate change can set the agenda for communities and governments everywhere, promoting innovation and solutions to achieving a net zero future.

In *Sustainable Sydney 2030*, we set a 2030 target to reduce emissions both across the city and in our operations by 70 per cent below 2006 levels. In our Environmental Action 2016-2021 Strategy and Action Plan, we have strengthened our renewable energy targets for both our own operations and in our local government area, extending our target to net zero emissions by 2050. These Council endorsed targets and actions are represented by a waterfall chart that outlines organisational emissions and the anticipated results of actions that will be taken in order to achieve the 2021 target of 44 per cent reduction. (See Chart 2)

The City's 'Asset Environmental Budget' (AEB) translates operational carbon emissions targets into a detailed plan. The AEB is incorporated into the Resource Plan to promote transparency in monitoring of our emissions

performance, timely decision making at a strategic level allowing the organisation to stay on track, and visibility of successful reduction measures.

### City of Sydney to go 100% renewable

The City of Sydney will further slash its greenhouse gas emissions by using 100 per cent renewables to meet its electricity needs. The renewables commitment endorsed by Council in March will see the City's operations cut emissions by around 18,000 tonnes a year – equivalent to the power consumption of around 4,000 households.

The City will preference purchasing renewable power from community-generated sources, and will purchase only 100 per cent renewable energy generated by wind or solar PV to power its larger sites and offset the carbon emissions in the electricity used at small sites.

This decision by Council will allow us to achieve our commitment to reduce emissions by 70 per cent, well ahead of our own 2030 deadline, well on the way to net-zero by 2050.

The shift to renewable electricity is happening much faster than anyone imagined. With the recent declaration that climate change should be treated as a national emergency, this is another way in which we can demonstrate that we lead by example, to inspire local residents and businesses to take action themselves.



## City of Sydney becomes a founding member of BRC-A



Business Renewables Centre Australia (BRC-A) is a not-for-profit initiative of Climate-KIC Australia, WWF-Australia’s Renewable Energy Buyers Forum and the Institute for Sustainable Futures (UTS). It provides a membership platform to simplify, streamline and accelerate corporate purchasing of large-scale wind and solar energy and storage. The City of Sydney is one of the founding members of this important organisation, along with over 60 other organisations, including councils, project developers and some of Australia’s best known and biggest companies.

Working with its partners, the BRC-A will drive best practice principles for negotiating and delivering, and eventually standardising corporate renewable power purchase agreements (PPAs) that reduce costs for purchasers, deliver fair returns for developers and financiers, and contribute to local and regional economies.

“It just goes to show that switching to renewable energy is a sound business decision, and one that is being considered in boardrooms and planning meetings all around Australia,” said Monica Richter, Project Director for BRC-A.”

The BRC-A website has been launched in Sydney and Melbourne.

## Net Zero Commitments

The City has set targets in line with what is necessary at the global scale to avoid the worst impacts of climate change. We all need to contribute to this outcome and the large and increasing number of organisations making these commitments is testament to the new opportunities from a clean economy.

The City acknowledges these organisations with a presence in our area who are using renewable energy and committing to net zero emissions targets.

(Please let us know if your organisation is not shown here.)



## Advocacy

The City has numerous successful partnerships and programs to deliver on our targets, and we are committed to leading by example in our own operations. However substantially more action and policy is required by the NSW and Australian governments to meet the City’s target for net zero emissions by 2050 – a target which aligns with Australia’s commitment to the Paris Agreement and the NSW government state-wide target.

During the reporting period the City has prepared submissions to the Australian Department of the Environment and Industry on the National Construction Code and to the Australian Government and Energy Security Board on the National Energy Guarantee.

We continue to work with a range of strategic partners including the Green Building Council of Australia and the Property Council of Australia to demonstrate the benefits of expanding the Commercial Buildings Disclosure scheme. Shared industry recommendations include reducing the threshold of disclosing energy performance; and expanding the scope of disclosure to include office tenancies and other building sectors.



## City of Sydney Operations

### Carbon Neutral Program

The City has been measuring, reducing and offsetting all of its operational greenhouse gas emissions since 2006/07. In 2011, the City of Sydney became the first of any level of Government in Australia to be certified as Carbon Neutral under the Australian Government National Carbon Offset Standard (NCOS).

The City remains carbon neutral by continuing to implement emissions saving projects, developing a greenhouse gas emissions inventory with independent verification each year, and through the provision of accredited offsets equivalent to 100 per cent of the organisation's emissions.

### How we do it

#### Measure

Any carbon neutral claims must be accurate and verified independently.

#### Avoid and reduce

The City has been achieving real energy and greenhouse gas emissions savings in our buildings, street lighting, and fleet operations.

### Renewable Energy

The City is rolling out solar PV to sites it owns to generate clean and cost-effective energy locally where and when it is required.

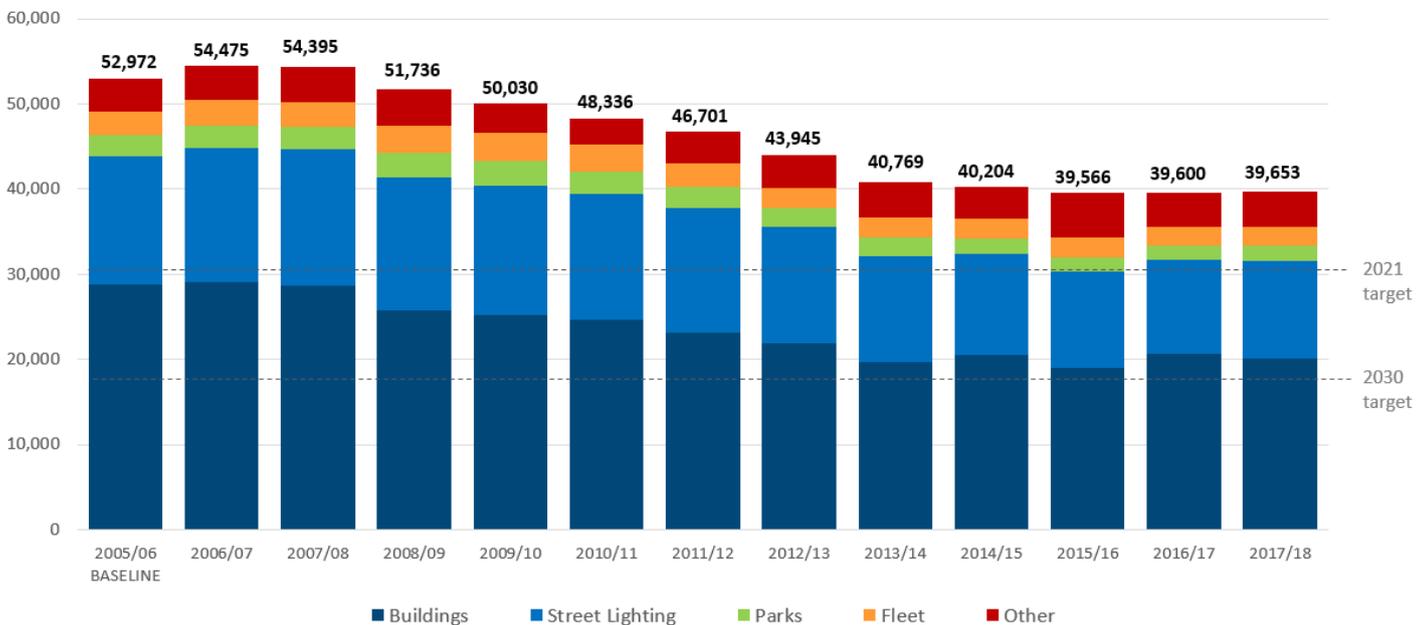
### Offset

The City reduces its carbon liability by avoiding and reducing emissions and using offsets for emissions that cannot be avoided.

### Relevant links

- [Carbon Neutral Program](#)
- [NCOS documentation](#)

Chart 1: City of Sydney operations greenhouse gas emissions





## Our operational targets



### Greenhouse gas emissions

- 44 per cent reduction in greenhouse gas emissions by end June 2021, based on 2006 levels
- 70 per cent reduction in greenhouse gas emissions by 2030 based on 2006 levels



### Renewable energy

- 50 per cent of electricity demand met by renewable sources by end June 2021

## How we are tracking

### Annual greenhouse gas emissions

Chart 1 tracks our actual annual operational emissions by category to the Sustainable Sydney 2030 target of a 70 per cent emission reduction against the 2005/06 baseline. Chart 2 incorporates projects currently in progress and their proposed effects. It is anticipated that as projects currently in progress begin to deliver scoped benefits, overall emissions will reduce accordingly.

Emissions from grid electricity are calculated based on the emissions factors, for NSW, currently 0.82 tCO<sub>2</sub>-e/MWh for scope 2 and 0.10 tCO<sub>2</sub>-e/MWh for scope 3 emissions. Greenhouse gas emissions are calculated using National Greenhouse Factors<sup>2</sup>.

### Energy consumption data

The table below shows energy consumption data for the organisation. It is important to note that while the City's total energy consumption has been increasing, total emissions have remained stable due to renewable energy in the grid resulting in lower emissions. The City will focus on new opportunities to improve energy efficiency and the procurement of renewable energy to meet energy and emissions targets.

| Organisation           | Electricity (MWh) | Natural gas (GJ) | Total energy (GJ) |
|------------------------|-------------------|------------------|-------------------|
| Baseline (Jun 2016)    | 42,427            | 21,894           | 174,631           |
| Last Year (Jun 2017)   | 30,371            | 69,934           | 179,270           |
| Most recent (Jun 2018) | 31,245            | 75,144           | 187,626           |
| Difference (baseline)  | -11,182 (-26%)    | +53,250 (+243%)  | +12,995 (+7%)     |
| Difference (last year) | + 874 (+3%)       | +5,210 (+7%)     | +8,357 (+4%)      |

<sup>2</sup> <http://www.environment.gov.au/climate-change/climate-science-data/greenhouse-gas-measurement/publications/national-greenhouse-accounts-factors-july-2018>.

The table below describes the sources for the annual operations greenhouse gas emissions data. For more information, see [Appendix 1: Data Management Plan](#).

| Title                                | Source  |
|--------------------------------------|---|
| Buildings, parks and street lighting | SMART (Sustainability Management and Reporting Tool)  |
| Fleet                                | Fleet services fuel consumption data.   |
| Other GHG                            | Various systems are used to collect emissions from other business activities such as contractor fuel, waste, flights, taxi journeys and refrigerants. |

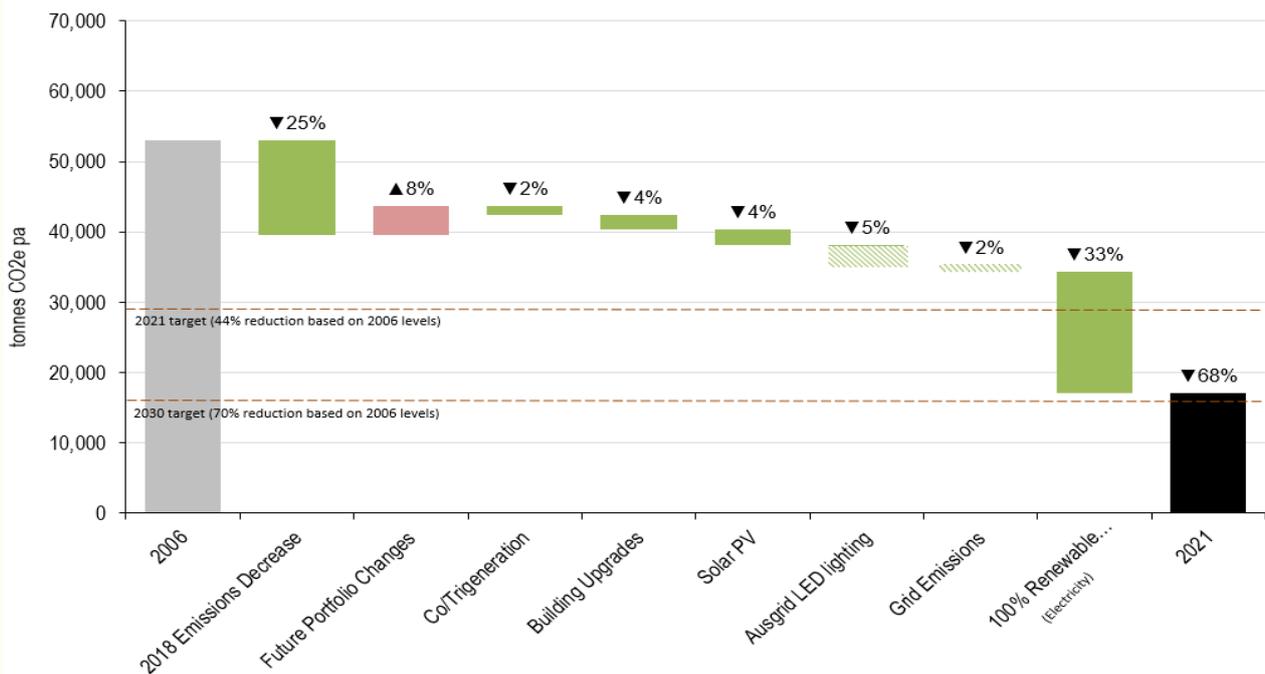




## How we will get there

As at June 2018, the City has a verified emissions reduction of 25 per cent from the 2006 baseline. The chart below shows the initiatives that the City has undertaken and the estimated contributions of the programs we will implement across our operational portfolio to exceed the target of reducing our emissions by 44 per cent by 2021. The commitment to 100% Renewable Electricity will enable the City to achieve a 68 per cent reduction of emissions by 2021. We will maintain our certified carbon neutral status each year through the purchase of verified offsets for those emissions we cannot eliminate, as we have since.

**Chart 2. City of Sydney operations greenhouse gas emissions targets to 2021. Estimated contribution of initiatives.**



### Completed Initiatives - 25% reduction achieved

The result since 2006 has been achieved by:

- Portfolio change (+3 per cent) over time including additional facilities Ian Thorpe Aquatic Centre, 343 George Street, Sydney, and Surry Hills Community Centre.
- Energy efficiency programs, solar installed to date, improved energy measurement and monitoring, behaviour changes and small works.
- Annual weather and changes in emissions factors.

### Initiatives to be completed by 2021

The 2021 emissions target remains at 44 per cent reduction from the 2006 baseline and due to the City's commitment to 100 per cent renewable electricity the current forecast is a 68 per cent reduction.

- Future portfolio increase (+8 per cent) assumes the expansion of the City's property portfolio for community and operational purposes.

**Increases:** Green Square Community and Cultural Precinct, Green Square Library and Plaza, Perry Park Recreation Centre Centre in 2018/19. Darling Library and Gunyama Park Aquatic Centre in future years.

**Increases** through developer contributions to the City: Greenland Tower Creative Hub and 178-186 George Street.

**Proposed Divestments:** Including Epsom Road and Marian Street Depots.

- Co/Trigeneration (-2 per cent) reductions will be accomplished through the operation of co/trigeneration facilities at Town Hall House, Cook and Phillip Park Aquatic Centre, Ian Thorpe Aquatic Centre.
- Building upgrades (-4 per cent) reflects estimated savings from efficiency upgrades in the most resource intensive properties via the Major Properties Efficiency Project (MPEP).
- Solar Photovoltaics (PV) (-4 per cent) on City properties (can deliver 15 per cent of electricity demand if battery storage provides a cost effective solution and the City can take advantage of virtual net metering between our sites).
- Ausgrid LED lighting (-5 per cent) The City is working with Ausgrid to do an accelerated upgrade of lighting to LED.
- Grid emissions (-2 per cent) estimate reductions from greening of the grid.

Renewable energy - for electricity (-33 per cent) is proposed to be purchased by the City directly from a renewable project through a Power Purchase Agreement (PPA).



Gunyama Park Aquatic and Recreation Centre: Construction works

## Operational Emissions Target

Similar in format to a four year financial budget, the following table provides annual Asset Portfolio carbon emission estimates to 2022 and include how the City will exceed the 2021 target.

|   |                | 2019/20       | 2020/21         | 2021/22         |
|---|----------------|---------------|-----------------|-----------------|
| <b>GHG Tonnes CO2e</b>  | <b>2018/19</b> |               |                 |                 |
| <b>Property Emissions Portfolio</b>                               |                |               |                 |                 |
| Carried forward Portfolio Balance                                 | 20,034         | 20,442        | 18,103          | 18,158          |
| <b>Add</b>  |                |               |                 |                 |
| Net Portfolio Changes   | 884            | 457           | 2,341           | 304             |
| <b>Reductions Emission Projects</b>                               |                |               |                 |                 |
| Building Upgrades   | (131)          | (813)         | (1,080)         | (100)           |
| Co/Trigeneration Installations                                    | 0              | (987)         | (215)           | 0               |
| Solar PV Installations  | (345)          | (997)         | (990)           | (27)            |
| <b>Total Property Emissions at End of Period</b>                  | <b>20,442</b>  | <b>18,103</b> | <b>18,158</b>   | <b>18,335</b>   |
| <b>Parks and Street Lighting Emissions</b>                        |                |               |                 |                 |
| Carried forward Portfolio Balance                                 | 13,269         | 13,226        | 11,974          | 10,697          |
| <b>Add</b>  |                |               |                 |                 |
| New Street Lights   | 83             | 82            | 0               | 0               |
| <b>Reduction of Emissions</b>                                     |                |               |                 |                 |
| Ausgrid LED Street Lighting Program                               | (127)          | (1,334)       | (1,277)         | (575)           |
| <b>Total Street and Parks Lighting Emissions at End of Period</b> | <b>13,226</b>  | <b>11,974</b> | <b>10,697</b>   | <b>10,122</b>   |
| <b>Other Emissions</b>  |                |               |                 |                 |
| Refrigerants, Waste and Water                                     | 2,124          | 2,124         | 2,124           | 2,124           |
| Contractor Fuel   | 1,261          | 1,261         | 1,261           | 1,261           |
| Organisational Fleet  | 2,417          | 2,417         | 2,417           | 2,417           |
| Corporate Emissions (Events, travel, etc)                         | 716            | 716           | 716             | 716             |
| Grid Emissions (benefit from greening the grid)                   | (434)          | (730)         | (1,016)         | (1,316)         |
| <b>Total Other Emissions</b>                                      | <b>6,084</b>   | <b>5,788</b>  | <b>5,502</b>    | <b>5,202</b>    |
| <b>Reduction of Emissions</b>                                     |                |               |                 |                 |
| Offsite Renewables  | 0              | 0             | (17,307)        | (17,307)        |
| <b>Total Offsite Renewables Emissions</b>                         | <b>0</b>       | <b>0</b>      | <b>(17,307)</b> | <b>(17,307)</b> |
| <b>Total Emissions at End of Period</b>                           | <b>39,752</b>  | <b>35,864</b> | <b>17,050</b>   | <b>16,352</b>   |

Baseline June 2006 Emissions GHG Tonnes CO2e 52,972      Emission Reduction June 2021 (68%)

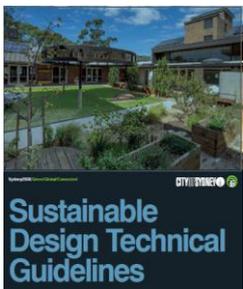


## Solar Exports under National Carbon Offset Standard



The City of Sydney has been certified as carbon neutral under the National Carbon Offset Standard program since 2011. Over this period the City has installed around a megawatt of solar panels to its sites. Where these solar systems export clean power back to the grid, the City to date was unable to claim these savings as a reduction against its carbon footprint. However a recent determination by the administrators of NCOS now makes it possible to claim the emissions savings from onsite solar exported to the grid where appropriately metered. This ruling is a welcome response to a recommendation made by the City and other NCOS participants and may result in larger solar installations which cost-effectively contribute to the City's renewable energy and emissions targets.

## Environmental Management System (EMS)



The City continues to improve its environmental management processes, in line with the ISO14001 standard and to ensure all City staff are aware of their environmental management responsibilities. The City recently developed the [Sustainable Design Technical Guidelines](#) and have made them available on the City of Sydney Website.

## Fleet

The new Alexandra Canal Depot in Alexandria is a state-of-the-art, purpose-built depot which is home to the new Fleet Workshop. Fleet Services moved to the site in March 2018. The site achieved a five-star Green Star Design rating, and utilises low-energy lighting along with solar and battery technologies.

Fleet emissions continue to contribute approximately 7 per cent of the City's total emissions and continuing efforts at emissions reductions focus on low-risk and eco-driving strategies. Low-risk driving practices almost always contribute to lower fuel or battery use and fewer emissions.

## Building upgrades

A key program for achieving energy and water efficiency within the City's property portfolio is the Major Properties Efficiency Project (MPEP). The program involves capital works, improvements to maintenance practices as well as user and occupant programs within fourteen City buildings. Projects implemented in FY2018/19 include improvements to HVAC systems, aquatic equipment efficiency (UV modulation, Variable Speed Drives and backwash optimisation) and completion of a feasibility study on connecting buildings to the Recycled Water Pipeline along George Street. Planned projects for FY19/20 include LED lighting upgrades, retrofitting water efficient fixtures, rainwater harvesting opportunities and further HVAC optimisation. These initiatives will contribute to achieving the City's emission and water reduction targets.

## Project Updates

### Solar PV and Energy Storage

The City is installing solar PV (photovoltaic) panels at multiple Council sites including office buildings, civic halls, libraries, works depots, community centres, sporting fields and other venues.

Five major installations were added during the 2019 financial year. These installations will increase the total installed capacity on City sites from about 1100 kW to over 1800 kW.

The City is also host to a first major energy storage facility in Sydney. In collaboration with TransGrid, a 500 kWh Lithium Ion battery system has been installed at the new Alexandra Canal depot. The battery facility allows the depot to use more renewable energy onsite from the solar PV (that would otherwise be exported to the grid).

### Trigeneration

The trigeneration system at Town Hall House has been installed and supplies low carbon electricity as well as heating and/or cooling to both Town Hall House and Sydney Town Hall.

The City regularly monitors the system and investigates for further fine-tuning and improvements.

It is expected that the system will cut carbon emissions by more than 40,000 tonnes over its 30-year lifetime, producing less than half the emissions than power from coal-fired plants that supply the majority of Sydney's electricity.

### Cogeneration at Ian Thorpe Aquatic Centre

The construction was completed in June 2018. The project team is reviewing the practical performance test results so that the practical completion can be achieved. The cogeneration is fully operational now and operates between 6:00am and 9:00pm daily. Once the practical completion is achieved, the project will aim to achieve up to 500 tonnes of CO2 emission reduction.

### Cogeneration at Cook + Phillip Park Aquatic Centre

The City has received a firm offer from one of the cogeneration suppliers specialised in pool heating solutions. The project involves a new 250 kW cogeneration unit, a new Chiller with heat pump, new heat pumps and new boiler. The City is in the process of negotiating the final offer with the supplier and will finalise in the second half of 2019. The project will deliver major Energy Services Upgrade for the Centre.



## World First Green Concrete Road Trial



At the City of Sydney we resurface around 50,000 square metres of asphalt road and lay over 25,000 square metres of new concrete footpaths every year. Paving roads and footpaths with recycled materials is part of our push to reduce our carbon footprint and recycle as much as we possibly can.

Four years ago, we started trialling green star concrete in our footpaths, and warm asphalt using printer toner, in our roads. Following its success, these materials are now required as part of Technical Specifications standards for design and construction.

Now the City is putting environmentally friendly concrete to the test in a world-first green road trial. Working with researchers from UNSW Sydney, we've replaced a 30-metre section of roadway on Wyndham Street in Alexandria with a new 'green' concrete blend.

The new concrete blend will use Geopolymer cement, made from fly ash and blast furnace slag, replacing traditional Portland cement and recycled materials. Geopolymer cement generates just 300 kilos of CO<sub>2</sub> per tonne of cement, compared to 900 kilos from traditional Portland cement production. The carbon emissions savings per tonne is equivalent to the electricity used by an average household every two weeks.

To test its durability, we've placed 15 metres of the new blend next to 15 metres of traditional concrete and will monitor the road over time. Sensors have been positioned under the concrete to monitor and compare how the Geopolymer concrete performs.

The Urban Heat Island (UHI) effect is the phenomenon that cities are generally warmer than the surrounding rural areas. This can be due to the common materials that are used in urbanised areas which lead to reduced vegetation and increased thermal storage.

## Cool Pavements Trial - completed



The City has been actively investigating and conducting trials on methods to reduce the UHI effect within the LGA. In 2014, the City installed a trial section of pale coloured road pavement (Ascrete - open grade asphalt pavement filled with concrete slurry) on Myrtle Street, Chippendale.

Data was collected both before and after installation from a nearby weather monitoring station as well as from community volunteers using handheld thermometers. Analysis of this data showed minor improvements to ambient and surface temperature following the installation of cool pavement however, this was not significant enough to outweigh the additional costs and durability concerns.

Colouring road pavements a pale colour to mitigate the UHI effect was deemed unsuitable for adoption into the City's Technical Specifications. Other UHI mitigation strategies like cool roofs, urban tree planting and concrete carriageways have proven to be more effective.



## 6 Star Green Star – Communities rating recognises Green Square town centre as national sustainability leader

It is imperative that urban renewal projects can demonstrate leadership in sustainability and the City of Sydney's fastest-growing neighbourhood has received national recognition as one of Australia's most sustainable communities, according to a prestigious certification program.

Green Square town centre in Sydney's inner south has been awarded a 6 Star Green Star – Communities rating from the Green Building Council of Australia. The town centre is a 14 hectare precinct, major retail, cultural and commercial centre only 3.5km from Sydney's CBD. The town centre will transform South Sydney's oldest industrial area into a new and vibrant neighbourhood when completed, including over 7,000 new residents and 8,600 workers. The town centre is part of the Green Square renewal area, which by 2030 will have more than 61,000 residents and 22,000 workers.

The rating recognises the sustainable planning, design, and construction of large-scale development projects across the country, including buildings, offices and community precincts. Six stars is the highest possible rating, denoting 'world leadership' in the areas of governance, liveability, economic prosperity, environment and innovation.

Green Square is an exemplary model for sustainable, high density living. The town centre features one of Australia's largest urban stormwater recycling schemes, as well as tree-lined, low-speed streets and extra-wide footpaths, self-watering raingardens, separated cycleways, and LED street lights. It's also socially responsible. There are 104 affordable housing units in the Green Square town centre allowing people to live close to their places of work, which reduces congestion and enhances wellbeing.

Close by is the 5 Star Green Square library and plaza, with its own wastewater system and innovative measures to reduce energy used for cooling, and the future Gunyama Park aquatic and recreation centre, which will be heated and powered by its own locally produced energy system.

In Green Square, we've shown that high density living can be created with environmental, social and economic sustainability in mind. The 6 Star Green Star – Communities rating is a fantastic recognition of our efforts.





## Women4Climate Conference

In February, the City of Sydney took part in the 3rd Annual Women4Climate Conference. This is an important forum hosted by C40 to bring together global mayors, business leaders, innovative change makers and the mentees from the Women4Climate initiative.

CEO Monica Barone was a judge in the Women4Climate Tech Challenge that formed a part of proceedings – an international contest open to women designing innovative, climate focussed tech solutions. The key goal of the Challenge was to pilot projects that would have a measurable impact in cities. The Tech Challenge ultimately aims to cultivate ground-breaking climate solutions that can be shared, scaled and implemented in other C40 cities.

This year the challenge was won by two young women:

- Elodie Grimoin for her Urban Canopee project. To be trialled in Paris this project provides autonomous and connected vegetal structures to allow cities to massively accelerate greening wherever trees cannot grow
- Inna Braverman for her Eco Wave Power project. This project sees energy extracted from ocean waves and converts it into electricity. The technology allows for the generation of efficient, fully renewable, and 100 per cent emission-free electricity at affordable prices. It will be trialled Tel Aviv-Yafo

## Advocacy

### LED streetlights

The City of Sydney plans to be the first local government area in Australia to replace all of its public lighting portfolio with energy-efficient LEDs. The City is partnering with Ausgrid (our local electricity utility) to fast track the upgrade of utility-owned street lights.

The upgrade involves replacement of conventional street light fittings (e.g. mercury vapour, compact fluorescent, sodium) with more energy-efficient LED street lights.

- Stage One of the upgrade involves 3,500 utility-owned street lights on residential streets and other minor roads. This will reduce emission by about 1,000 tonnes a year.
- Stage Two of the upgrade involves 6,500 utility-owned street lights on main roads and in places with high public lighting levels (e.g. commercial centres). This will reduce emissions by another 2,400 tonnes a year.

When both stages are complete, the City will have reduced emissions by about 3,400 tonnes a year. The City will also save over \$1 million a year in operational savings, thanks to reductions in light bulb failures (LEDs last over 10 years) and in electricity use.

The Ausgrid upgrade program builds on the success of an initiative by the City to replace our own street light fittings with LEDs. The City was the first local government area to install energy-efficient LED street lights on a large scale. As part of a \$7 million project, we replaced over 6,000 City-owned street and park lights between 2012 and 2016. This reduced emissions by over 2,000 tonnes a year and reduced operational costs by about \$800,000 a year.

More information about the current street light upgrade program is on the Ausgrid website at:

<https://www.ausgrid.com.au/In-your-community/Streetlights/LED-Streetlight-Rollout>



## The local government area

### Local government area targets



#### Greenhouse gas emissions

- 70 per cent reduction in greenhouse gas emissions by 2030 based on 2006 levels
- Net zero emissions by 2050



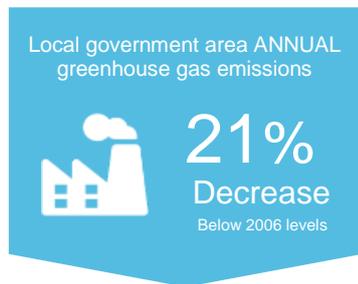
#### Renewable energy

- 50 per cent of electricity demand met by renewable sources by 2030<sup>3</sup>

### How the local government area is tracking

#### Annual greenhouse gas emissions

Chart 3 tracks actual emissions from the local government area. Note that as at 2017-18 emissions have reduced by 21 per cent since the 2006 baseline.



The City recently updated the way we report emissions in order to become compliant with the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)<sup>4</sup> – the new international benchmark for reporting city emissions.

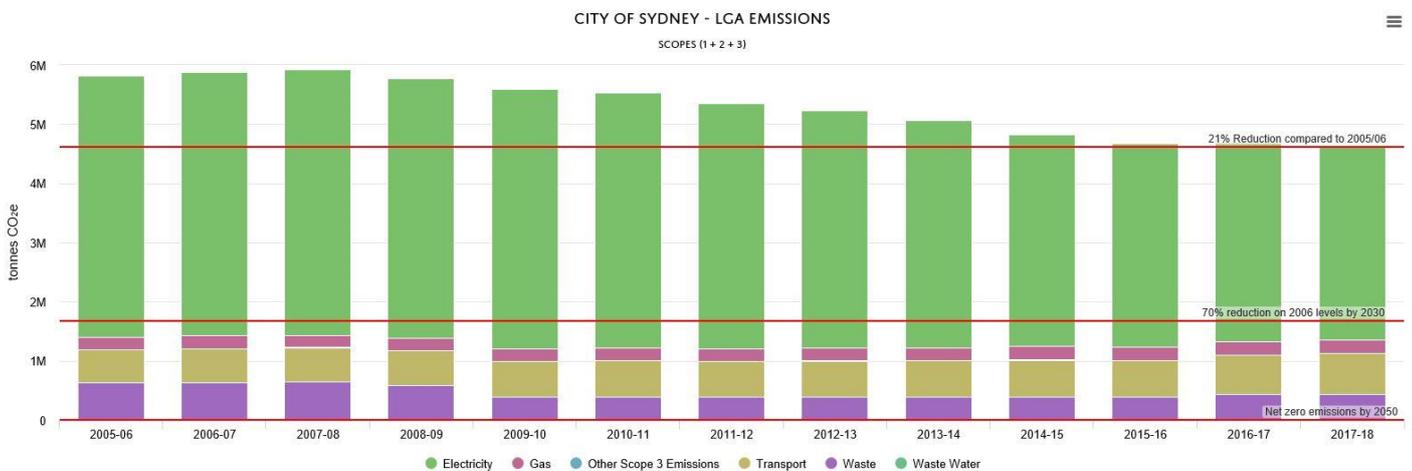
The table below shows energy consumption data for the LGA. Please note, LGA data is shown to June 2018, which is the most up to date data available. The City is advocating to Ausgrid to provide this data much sooner after the financial year.

| LGA                        | Electricity (MWh) | Natural gas (GJ) | Total energy (GJ) |
|----------------------------|-------------------|------------------|-------------------|
| Baseline                   | 4,159,436         | 3,038,529        | 18,012,502        |
| Most recent (to June 2018) | 3,417,972         | 3,575,314        | 15,878,016        |
| Difference                 | -741,464          | +536,785         | -2,134,486        |
| Difference (per cent)      | -18%              | +18%             | -12%              |

### Energy consumption data

For more information see [Appendix 1: Data Management Plan](#).

Chart 3: Local government area greenhouse gas emissions



<sup>3</sup> The renewable electricity target incorporates renewable electricity both within the grid and classified as additional to the grid.

<sup>4</sup> <http://www.ghgprotocol.org/city-accounting>



### How we will get there

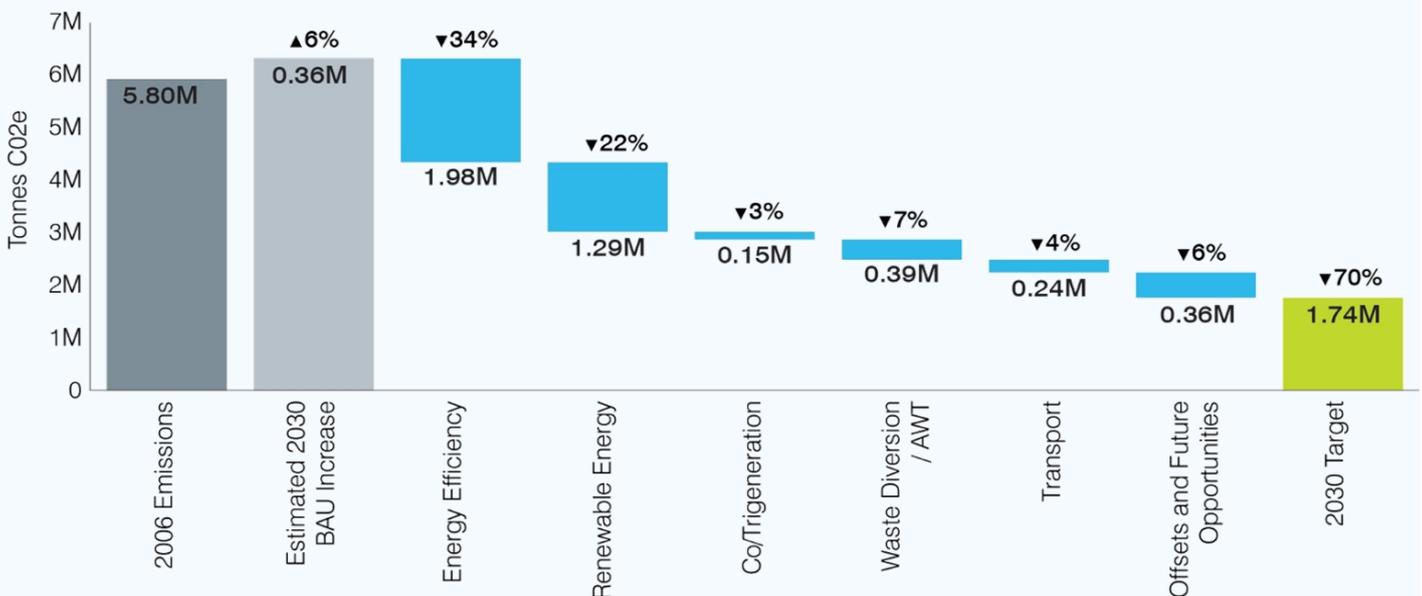
Chart 4 shows the estimated contributions of the initiatives we expect could lead to reduction of the city’s emissions by 70 per cent by 2030.

Since 2007 total greenhouse gas emissions across the local government area have continued to fall and this is despite significant growth in the economy (32 per cent), the number of new residents (25 per cent) and businesses, new developments and other economic indicators.

Most greenhouse gas emissions in the City of Sydney local government area are due to buildings. Emissions are falling due to improved energy efficiency awareness and practices, and the increase of renewable energy in the grid and locally. However, as buildings become more efficient, and as more people live and work in the area, emissions from transport are growing as a proportion of the total.

Achieving the target will require a major increase in focus on improving the energy efficiency of new and existing buildings, and increasing the amount of renewable energy locally and in the grid, especially as Australia’s aging coal generation fleet reaches end of life. The electrification of transport, powered by an increasingly renewable grid will make a notable contribution to reducing emissions from transport.

**Chart 4: Local government area greenhouse gas emissions target. Estimated contribution of initiatives.**



- Energy efficiency (-34 per cent) calculated on the basis of existing and new state and federal government policies and programs
- Renewable energy (-22 per cent) reflects 50 per cent of electricity being provided by renewable sources
- Co/trigeneration (-3 per cent) is based on historic average installation rates
- Waste diversion/advanced waste treatment (-7 per cent) reflects savings from avoided landfill emissions
- Transport (-4 per cent) emissions reductions would be realised by use of vehicles with lower emissions intensity, and by changing the mode split to move away from car travel and towards public transport and walking and cycling
- Offsets and future opportunities (-6 per cent) include savings that could be made from transport, waste, renewable energy, energy efficiency, regulatory and/or technological improvements, or other opportunities. Offsets could be purchased by those entities generating emission

### High Voltage Electricity Data

The electricity distributor has provided community-wide high-voltage (HV) electricity data for City of Sydney local government area. HV electricity is now around 14 per cent of total LGA electricity however we do not include this in the City’s official GPC community inventory as it is unclear how reliable or replicable this data is due to confidentiality reasons. While electricity usage is generally declining as buildings and equipment become more efficient, HV electricity is actually on the increase - most likely due to increasing demand for rail public transport and data centres. More renewable energy supply will be key to reducing emissions from these sectors on a trajectory to net zero.



## Project Update

### Green Square Community Wood Workshops

In June, the City of Sydney together with Bower Reuse and Repair hosted two workshops at the Green Square Community Hall. One of the trees removed for the Joynton Avenue flood mitigation works was repurposed by participants while they were guided through developing their working with wood skills.

### Green Star Building Rating for Library and Plaza

A major project in the Green Square Town Centre which will grow its green credentials is the award winning Library and Plaza. The brand new Green Square Library was officially opened in October 2018. The innovative underground library is located in the plaza in the heart of Green Square, next to the train station.

The library and plaza have a 5-star rating from the Green Building Council of Australia. Some of the features that helped us achieve this rating are a central wastewater system and a low energy displacement ventilation system within the library's bookshelves.

The superior design of the new facilities has already been recognised. Green Square Library and plaza was a big winner at the 2019 NSW Architecture Awards, taking home the John Verge Award for interior architecture, the NSW Premier's Prize and awards in the public and urban design categories. It has also won a global award and was shortlisted as one of Sydney's best new spaces.

The Green Square Town Centre is an innovative precinct, which can serve as a model for other urban renewal communities.

## Advocacy

### Standards for urban renewal precincts

Two upcoming urban renewal precincts in our local area – Central to Eveleigh/Waterloo, and the Bays Precinct – present the opportunity to deliver world-leading environmental sustainability outcomes. The NSW state government will be redeveloping these sites, and the City will advocate for high environmental standards for these areas as they will be bringing tens of thousands of new residents into our LGA – and we want their environmental footprint to be as small as possible. This is a key way for the State Government to apply its own target for net zero emissions across the state by 2050.

## Advocacy

### Increase the building code targets

BASIX and the National Construction Code are the mandatory planning instruments that set the minimum standard for energy and water efficiency of new buildings. The BASIX standard was set 12 years ago and has not kept pace with new technology and falls short of current best-practice. Standards must be raised now to ensure we don't build more new poor-performing buildings that will lock-in carbon emissions for decades to come. The NSW government needs to increase BASIX targets for minimum environmental performance in residential buildings. The National Construction Code also needs to develop a net zero trajectory with clear review and update milestones. The City is a member of the Australian Sustainable Built Environment Council (ASBEC) which has prepared a major report called *Built to Perform: An Industry Led Pathway to a Zero Carbon Ready Building Code* [www.asbec.asn.au/publications/](http://www.asbec.asn.au/publications/) - this will provide a good basis for City advocacy.

## Relevant links

- [Sustainable Sydney 2030](#)
- [Energy Efficiency Master Plan – improving energy productivity: 2015-2030](#)
- [Decentralised Energy Master Plan - Renewable Energy: 2012-2030](#)
- [Carbon Neutral Program](#)



# 5. Water sensitive city



**Water is crucial to the social, economic and environmental wellbeing and survival of our city. Our city's forecasted population growth to 2030 will increase the use of our green public spaces, placing pressure on these spaces to remain green and our waterways to stay clean.**

## **Sydney Water announces water restrictions**

With storage levels in the Greater Sydney region falling to 52 per cent, Sydney Water has announced water restrictions. Water restrictions apply to all of Greater Sydney and include residents and businesses.

Water is a limited and natural resource. Greater Sydney's population is growing rapidly and expectations for more liveable cities are creating new and increased demands for water. This in turn places additional pressure on our water supplies.

To add to this pressure, urbanisation also has impacts on our local communities' water needs and waterways. An increasingly variable and changing climate means we can't know with certainty how much rainfall will support our water supply system in the future.

The City continues to develop alternative water supplies including non-rainfall dependent sources such as recycled wastewater.



## Advocacy

### Recycled Water Pricing

Recycled water becomes even more critical as Sydney's drinking water supplies continue to diminish through the ongoing drought. However current water pricing and policy makes investment in recycled water schemes complex and expensive. This is why the City of Sydney continues to advocate to the NSW Government for changes that will promote investment, innovation and competition in the recycled water market.

The City commended IPART on some positive changes proposed during its recent review of recycled water prices for public utilities. These changes begin to recognise the external benefits of recycled water including enhanced liveability and improved environmental outcomes. Despite these positive steps, the City will continue to advocate for further reforms required to ensure investment in recycled water schemes to drought proof our city.

### How we will get there

The City is currently using the updated water data to revise the range and magnitude of actions to achieve stated targets. A new waterfall chart has been produced (chart 6) and will be updated in future Green Reports once actual data is available and projects have been further refined.

## Our operational targets



### Water consumption

- Zero increase in potable water use by end June 2021 from 2006 baseline, achieved through water efficiency and recycled water
- Annual potable water use of 180L/m<sup>2</sup> of irrigated open space by end June 2021

The City is transforming to be a water sensitive city that is resilient, cool, green and productive. Our water management approach to meet these targets involves:

- Using less water through changes in behaviour and using water efficient fixtures and fittings
- Capturing alternative water sources to recycle and use for non-potable purposes
- Reducing stormwater pollution, minimising local flood risk, enhancing greening and urban cooling through retrofitting the stormwater management network with raingardens, wetlands, swales and gross pollutant traps

Our approach will drought-proof our city to ensure we can use water when it is hot and dry. Our waterway health will be improved and non-potable water supplies will be safeguarded for use in the next century and beyond.

The predicted impacts of climate change and population growth will strain our potable water supplies, with potable water demand in the local government area estimated to be 30 per cent higher in 2030 than in 2006.



## City of Sydney Operations

### How we are tracking

#### Annual water consumption

As at June 2019, the City operations potable water use increased by 19 per cent from the 2006 baseline, from 431 to 512 megalitres per annum (MLpa). Note the latest data includes 40 per cent accruals as quarterly water bills have not been finalised. The increase since the baseline is due to a number of factors including:

- The ongoing transition to the utilities management system (SMART) uncovered previously unaccounted for accounts and meters.
- Water leaks and high consumption at multiple sites. A number of leaks have been rectified in the 2018/19 period.
- Changes to City's portfolio (buildings and parks) and high consumption tenant sites.



Despite the 19 per cent increase since the baseline, Chart 5 shows a decrease in potable water consumption from the 2017/18 to 2018/19 period from 548 to 512 MLpa. This is largely due to better data management during the first year of implementation of the new utilities data platform allowing us to identify, investigate and address anomalies in water consumption.

The decrease from 2017/18 has been a result of the City rectifying the following anomalies:

- a major leak at a public toilet (13A Refinery Drive) was identified and has since been rectified
- additional irrigation was required for returfing sections of Erskineville Park & Oval in 2017/18, with irrigation rates normalising in 2018/19.

The following issues and sites have been highlighted for management due to high water consumption in 2018/19:

- anomalies at Sydney Park are currently being addressed and monitored, with staff regularly inspecting the site
- commissioning of Wulaba Park in 2018/19 required additional irrigation
- Alexandra Depot is now fully operational and as a result has an increased water use

- Beaconsfield Park had a major leak at a public toilet which has been rectified.

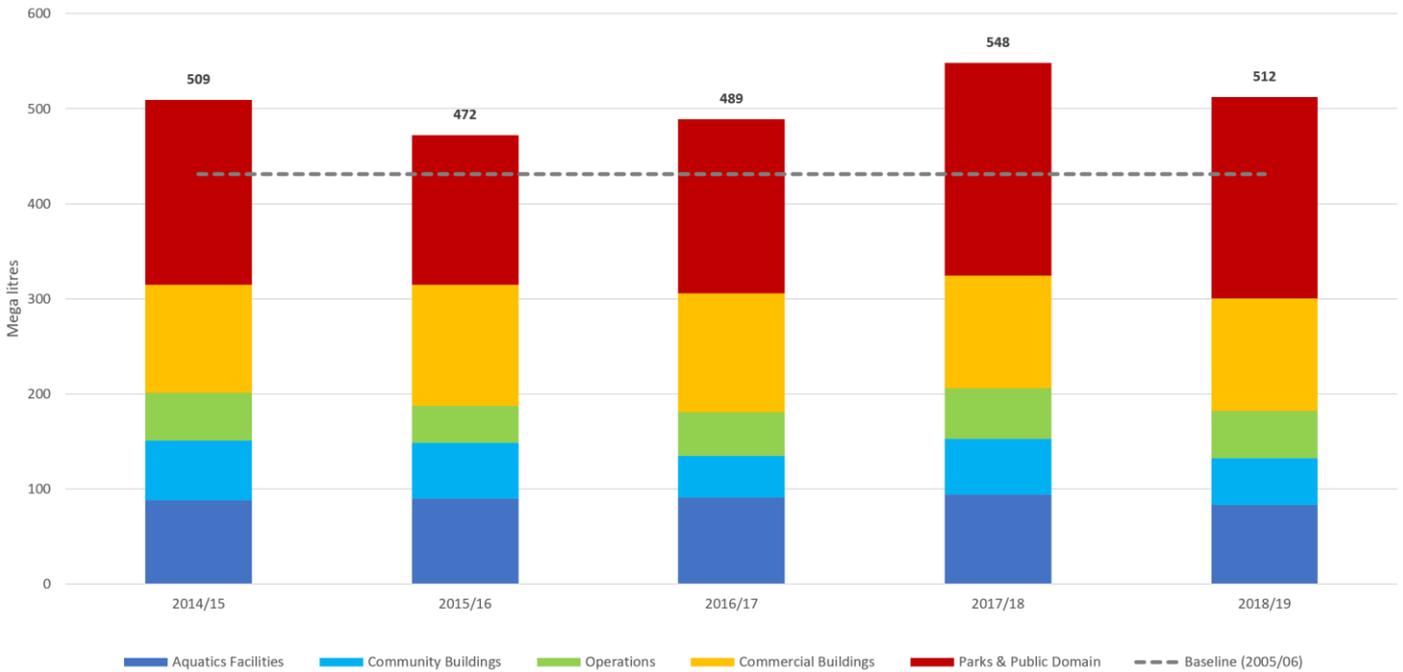
A working group has been established to continue to improve our data management and reporting processes. The priorities for this working group include:

- timely review of water consumption data to identify and rectify anomalies such as leaks
- continual review of water data categorisation to ensure we only pay and report on the City's operational footprint
- development of a comprehensive metering and monitoring program to provide more granular and regular data at sites.

In addition to this program of works, updates to the Parks Water Saving Action Plan will further identify efficiency measures, development of alternative water sources, improved management practices, new technologies and improvements to monitoring and reporting.



**Chart 5: City of Sydney operations potable water use**



- All data sourced directly from Sydney Water and contained within and reported from the new data management system SMART. Note that 2018/19 data includes 40 per cent accruals as quarterly report were not available at the time of reporting.
- Parks and Public Domain - Includes parks, reserves, playgrounds, street closures, garden beds and nature strips. Also included are water features that are in the public domain.
- Commercial buildings- Includes income producing buildings, such as Customs House, parking stations and retail shops. It also includes properties acquired for strategic purposes that do not fall into the above categories.
- Operations - Includes depots and workshops.
- Community buildings- Includes childcare centres, libraries, community centres and town halls.
- Aquatic Facilities – Includes Victoria Park Pool, Andrew (Boy) Charlton Pool, Cook and Phillip Park Aquatic Centre, Ian Thorpe Aquatic Centre and Prince Alfred Park Pool.
- Exceptions - Only sites where the City has ‘operational control’ are included. Properties where a whole building is leased and the tenant has full building operations and maintenance obligations, such as the Queen Victoria Building and the Capitol Theatre, are excluded.
- Note - A number of City buildings are used for multiple purposes – for example Customs House is used for office and retail, along with library and exhibition uses. In allocating each property to one of the above categories, the dominant water user was the determining factor. Over time the categorisation of a property may change depending on the use.

**Water consumption data**

| Organisation              | Baseline (ML) | Current (end 18/19) (ML) | Difference (ML) | Difference (per cent) |
|---------------------------|---------------|--------------------------|-----------------|-----------------------|
| City of Sydney operations | 431           | 512                      | 81              | 19                    |

**Calculation**

Difference = (Current - Baseline)  
 Per cent Difference = (Difference / Baseline) x 100

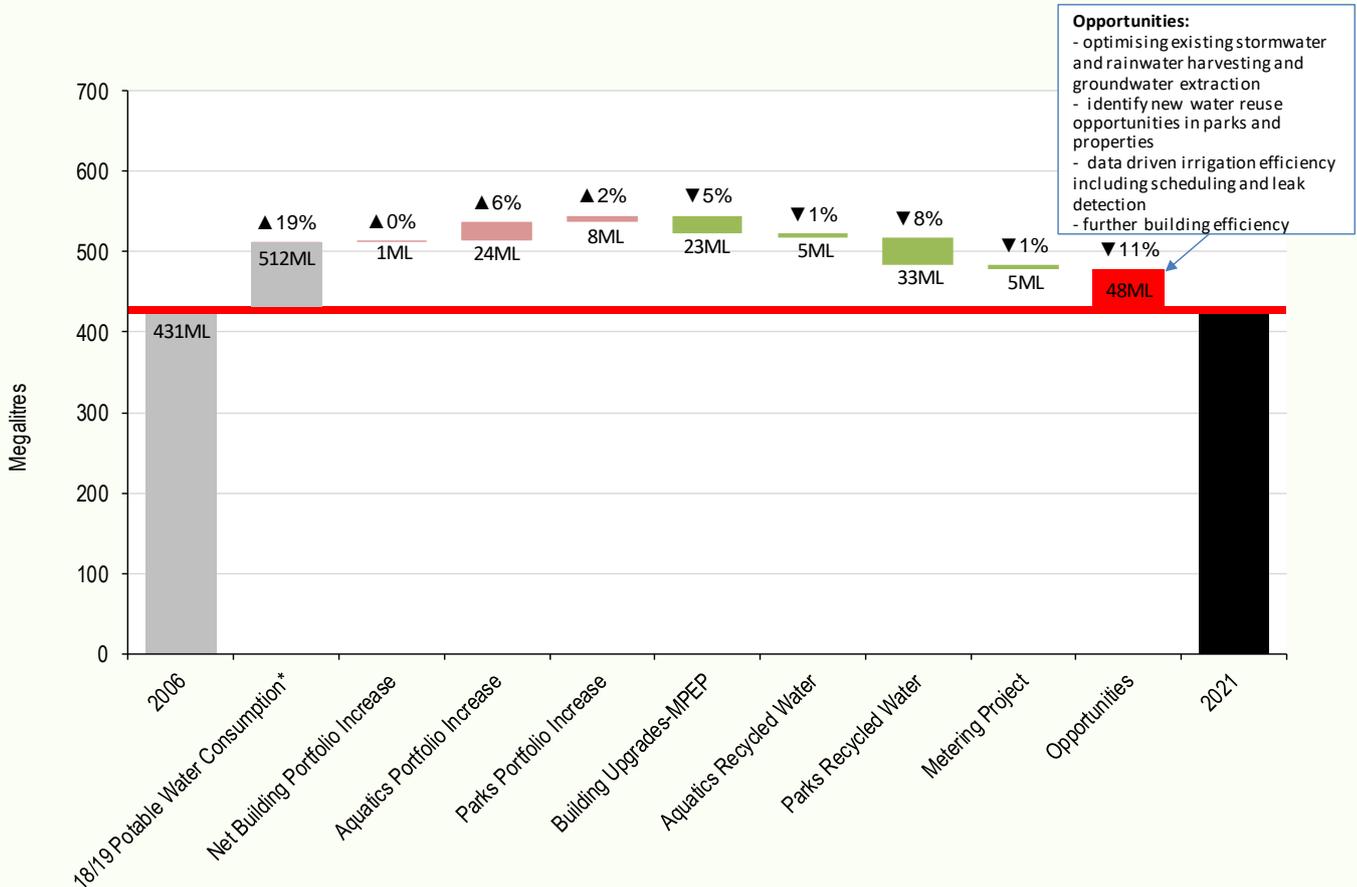
For more information see [Appendix 1: Data Management Plan](#)



## How we will get there

Chart 6 shows the forecast increase in water consumption due to the City’s growing portfolio of buildings, aquatic centres and parks. It also shows the estimated reductions in potable water consumption associated with projects we plan to implement across our operational portfolio to meet our target to maintain our potable water use at 2006 levels.

**Chart 6: City of Sydney operations potable water use target to 2021. Estimated contribution of initiatives.**



\*18/19 consumption data based on 40% accruals

The City’s existing initiatives to reduce potable water consumption include:

- Connecting our parks and buildings to alternate water supplies, such as harvested stormwater and rainwater
- Upgrading irrigation systems to be more efficient
- Retrofitting our high water-using properties with water efficient fixtures and fittings
- improved data management and monitoring to identify, investigate and rectify anomalies in water consumption.

Despite these initiatives, the City’s water consumption continues to grow and our 2021 forecast potable water consumption is estimated to further increase due to growth in our building, aquatic centre and parks portfolios.

The City currently has a suite of projects underway to reduce potable water consumption through both efficiency and connection to recycled water through to 2021. These include:

- The Major Properties Efficiency Project (MPEP) has identified 23MLpa potable water savings across the City’s highest 14 water using properties through rainwater harvesting, water efficient fixtures and fittings and facilities’ management actions
- Gunyama Aquatic centre rainwater harvesting system will provide water for pool top up and recycled water from Green Square Town Centre water reuse scheme will be used for toilet flushing, saving a total of 5MLpa
- Recycled water will be supplied to parks (approximately 33MLpa) including Sydney Park, Erskineville Oval and within Green Square urban renewal area through stormwater harvesting schemes
- The metering project has been estimated to save 5MLpa through improved detection of leaks and reduced response times for rectification, however these may not be realised until after 2021.

Despite these projects that are currently at various stages of project delivery, there is still a gap between the City’s predicted potable water consumption by 2021 and predicted savings through these initiatives. The City is investigating additional project opportunities to meet its 2021 target and will continue to develop precinct scale recycled water schemes to contribute to its 2030 targets.

Chart 6 will be updated in future Green Reports once actual data is available and projects have been further refined including additional project opportunities.



## Project Update

### Water Consumption in Parks

Since 2006, the area of parks and open spaces requiring irrigation in the Local Government Area (LGA) has increased by 54 per cent.

These include Harold Park, Wentworth Park, Redfern Park, Redfern Oval, Pirrama Park, Harmony Park, Prince Alfred Park, Paddington Reservoir Gardens, Peace Park, Lillian Fowler Reserve, Mary O'Brien Reserve and Coulson Street Reserve. The total irrigated area as of June 2019 is 816,538 m<sup>2</sup> against the baseline of 531,953 m<sup>2</sup>.

The City's target for water usage in city parks is 180L per square metre of irrigated space by the end of 2021. In the 2018-2019 financial year, City parks and open spaces used an estimated 260 L per square metre of irrigated space, note this figure includes 40 per cent accruals. Water use was lower this year than the previous year, probably due to higher annual rainfall. In addition, reported water consumption has improved as a result of transitioning to the data management platform (SMART).



The City recently welcomed Skyline Landscape Services as our new Parks and Open Space Maintenance service provider. Commencing services on 1 June 2019, Skyline is maintaining our parks and open spaces in the northern part of the local government area, providing horticultural and turf management services, park infrastructure maintenance and cleaning and waste removal. Under the contract, the City is working with Skyline to ensure they make a meaningful contributions towards the City's 2030 targets for water efficiency, renewable electricity, resource recovery and greening Sydney.

A significant portion of the City's water is used in our parks and open spaces. To help achieve our targets, the contract requires Skyline to take a holistic approach to managing water and achieving sustainably irrigated open space. This includes water demand management, best practice irrigation efficiency and the evaluation and implementation of new water practices and technologies. Skyline is required to report on their water using activities and water performance is a key performance indicator of the contract. Other initiatives and requirements of the contract include:

- Use of an electric buggy at Jubilee and Hyde Park to empty park bins
- Supervisors will use electric bikes to move between sites and reduce use of vehicles
- Electric hand tools reduce emissions and noise
- Green waste recovery prevents waste to landfill
- Scheduling and routing to reduce vehicle movements in the city.

This table provides estimated water usage numbers as described for chart 5

| Financial Year | Actual potable water use (kL) | Irrigated area (m <sup>2</sup> ) | Increase in irrigated area from baseline (%) | Irrigation intensity (L potable water/m <sup>2</sup> irrigated area) |
|----------------|-------------------------------|----------------------------------|--|--|
| 2006           | 132,946                       | 531,953                          | -  | 250  |
| 2014           | 171,967                       | 808,479                          | 52.0   | 213  |
| 2015           | 194,217                       | 808,479                          | 52.0   | 240  |
| 2016           | 157,788                       | 810,538                          | 52.4   | 195  |
| 2017           | 184,830                       | 810,538                          | 52.4   | 228  |
| 2018           | 240,327                       | 816,538                          | 53.5   | 294  |
| 2019           | 212,074                       | 816,538                          | 53.5   | 260  |



Harold Park

## Project Update

### Harold Park

Harold Park received the Lloyd Rees Award for Urban Design and was jointly awarded the 2019 Lord Mayor's Prize. The area includes nearly four hectares of public parkland, cycling and walking paths and playgrounds.

The park was built with an extensive stormwater harvesting and treatment scheme to supply the irrigation needs of the park and nearby sports fields with recycled water. The scheme also improves the quality of the stormwater entering the Johnston's Creek Canal.

Harold Park is in Forest Lodge, near Glebe and Annandale. The City of Sydney and the Central Sydney Planning Committee shared planning control of this urban renewal project and Mirvac developed the site. The developer was required to dedicate more than one-third of the privately-owned site to the City for a public park – 3.8 hectares of previously private space has now become public open space. The park includes new trees, shrubs and landscaping, open lawn areas, custom-built playground, cycling and walking paths, and is a wildlife corridor.

The project included the installation of a stormwater harvesting and treatment scheme. Stormwater is taken from an underground Sydney Water drain to a Gross Pollutant Trap, which removes litter, coarse sediment and organic matter from the stormwater. From there, the water is transferred to a treatment system which uses a screen filter and ultraviolet (UV) disinfection to treat the water to a quality that is suitable for irrigation. The system also includes a number of raingardens that capture and clean water runoff from the park.

The treated water is used to irrigate the lawn area at Harold Park and the nearby sporting fields at Jubilee Oval and Federal Park.

The Harold Park stormwater harvesting and treatment system has now been in operation for a full year and in 2018-19 it met about 61% of the irrigation demands, saving over 14,000 litres of water each day.

## Project Update

### Johnston's Creek Wetland

Johnston's Creek Wetland is a key element of the Johnston Creek Parklands that were once an important part of the estuarine system that flows into Rozelle Bay. The City is committed to improving water quality entering the harbour. The City is partnering with Sydney Water to develop a freshwater wetland in Johnston Park near the Crescent. Johnston's Creek Wetland will treat the stormwater from the 1.8 hectare residential catchment in a 1150 m<sup>2</sup> constructed wetland.

Constructed wetlands are considered to be a key treatment process in stormwater management. They provide treatment for the removal of nitrogen, phosphorus, suspended solids and heavy metals from stormwater, as well as providing other benefits such as habitat creation and aesthetic value. The wetland will remove pollutants via a gross pollutant trap connected to the stormwater drain before the water enters the wetland system. The wetland will have native aquatic plants that remove nutrients from the water as it flows through the system before being discharged into the creek system.

The Johnston's Creek Wetland was identified through the Johnston's Creek Master Plan 2013. It will improve the water quality entering the Johnston Creek canal and will complement the canal naturalisation work currently being undertaken by Sydney Water. The wetland will be an important habitat stepping stone for aquatic birds and other native animals and improve the ecological value of the park and green corridor.

The Johnston's Creek Wetland will commence construction in 2020/21.



## Project Update

### CBD Recycled Water Scheme

As part of the construction of the Sydney Light Rail project, at the request of the City, recycled water pipelines are being installed along George Street between Circular Quay and Central. Significant sections of recycled water pipeline have been installed and construction continues.

This provides an invaluable opportunity to develop a recycled water scheme to connect the city's highest water demand area with a recycled water source.

It is envisaged that wastewater could be collected in the city and treated to produce recycled water for non-potable uses such as irrigation and cooling tower use.

The recycled water pipelines would be used to deliver recycled water to buildings and parks in the CBD. A recycled water pipeline has also been installed in Wynyard Walk which could potentially link the Barangaroo precinct to the CBD. The recycled water scheme would require approval and a license under the Water Industry Competition Act.

Initially the City plans to connect its own highest water using assets including Town Hall House and Hyde Park.

Existing building owners could also connect their cooling towers and new buildings could connect for all non-potable uses.

By replacing potable water with recycled water, this project has the potential to provide a valuable contribution to the City's target of zero increase in potable water use by 2030 from 2006 baseline.

## Project Update

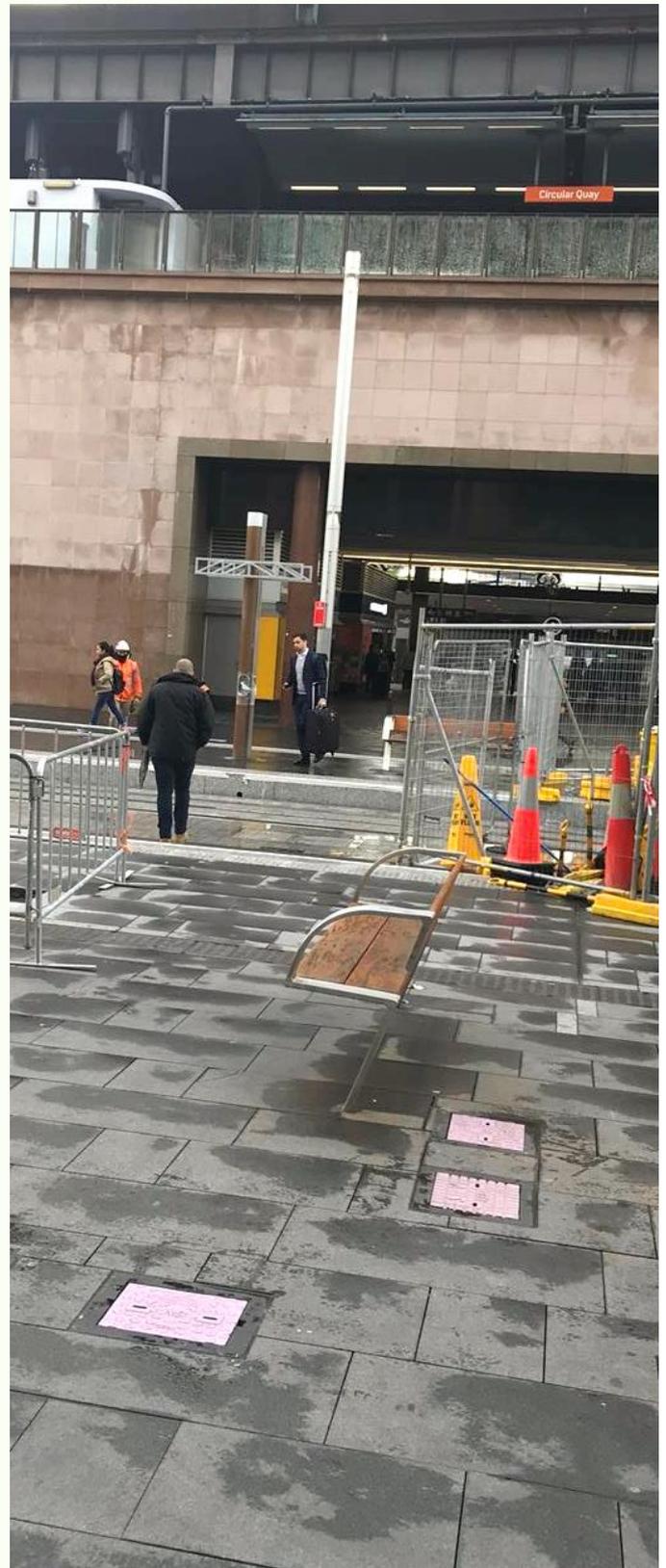
### Green Square Water Reuse - Stage 2

The best opportunity to develop water recycling projects in the City of Sydney area is within urban renewal areas because they provide the density and scale required for efficient investment in recycled water infrastructure.

Infrastructure provision can be planned and installed at the time of development, which is cheaper and more efficient than retrofitting.

Redevelopment also allows private water utilities to offer water services across an entire precinct, improving commercial viability. The City is investigating the use of planning controls to encourage the delivery of recycled water services.

The City is developing a utility led water reuse scheme in the Greater Green Square area outside of the town centre. Unlike Green Square Water Reuse Stage 1 which captures stormwater for reuse, Stage 2 will collect locally generated wastewater for treatment and reuse. The development of the Stage 2 scheme has slowed, in part by 2016 changes to water pricing. Current pricing and regulatory barriers in the water sector continue to challenge the development of recycled water schemes such as the one envisaged for Stage 2.





## Local government area targets



**Water consumption** – Zero increase in potable water use by 2030 from 2006 baseline, achieved through water efficiency and recycled water



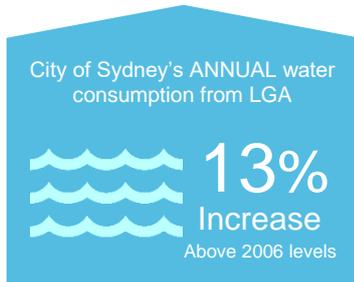
**Stormwater quality** – 50 per cent reduction in the annual solid pollution load discharged to waterways via stormwater by 2030  
– 15 per cent reduction in annual nutrient load discharged to waterways via stormwater by 2030



## The local government area

### How are we tracking?

Chart 6<sup>5</sup> shows annual potable water consumption across the city has grown 13 per cent against our 2006 baseline, during which time the city's population has grown at least 40 per cent<sup>6</sup>. This is an increase of 1 per cent on 2016/17 data, which is impacted by a dry, hot year.



Water efficiency programs, environmental performance grants and recycled water schemes will continue to relieve pressure on our potable water supplies.

Our policies to incorporate recycled water in new precinct scale developments will assist in keeping our city green and cool and use less potable water for non-potable uses.

Increased growth in the local area and the removal of state government-imposed water restrictions after the previous drought have led to annual consumption rising above the baseline in recent years. This is despite great success in the City's Smart Green Business and the Better Buildings Partnership<sup>7</sup> programs saving over 2,000 ML (mega litres) per annum in potable water. Sydney Water reintroduced Level 1 water restrictions on June 1 2019 in response to the ongoing drought. This should reduce potable water consumption which may be observed in future reports.

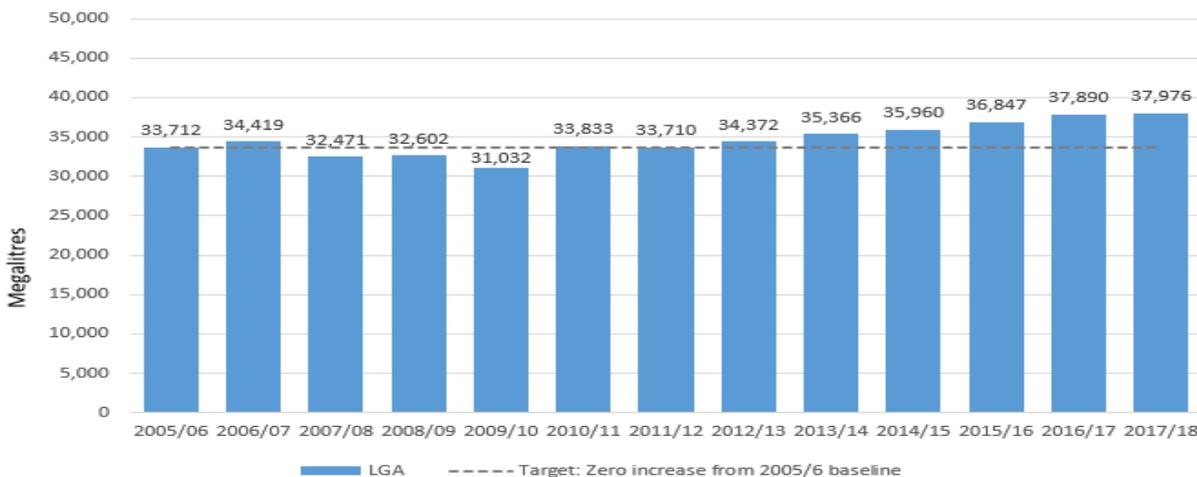
### Water consumption data

This table shows water consumption data for the local government area. Data for the local government (LGA) is based on actual data received from Sydney Water in October 2018 for consumption to end 2017/18. Data for 2018/19 will be available in October 2019 and will be included in the next report.

|     | Baseline (ML) | Current (end 17/18) (ML) | Difference (ML) | Difference (%) |
|-----|---------------|--------------------------|-----------------|----------------|
| LGA | 33,712        | 37,976                   | 4,264           | 13             |

For more information, see [Appendix 1: Data Management Plan](#)

Chart 6 Local government area potable water use.



<sup>5</sup> All data sourced directly from Sydney Water.

<sup>6</sup> Based on 2016/17 LGA population data for residents/workers/visitors compared to 2005/2006 baseline.

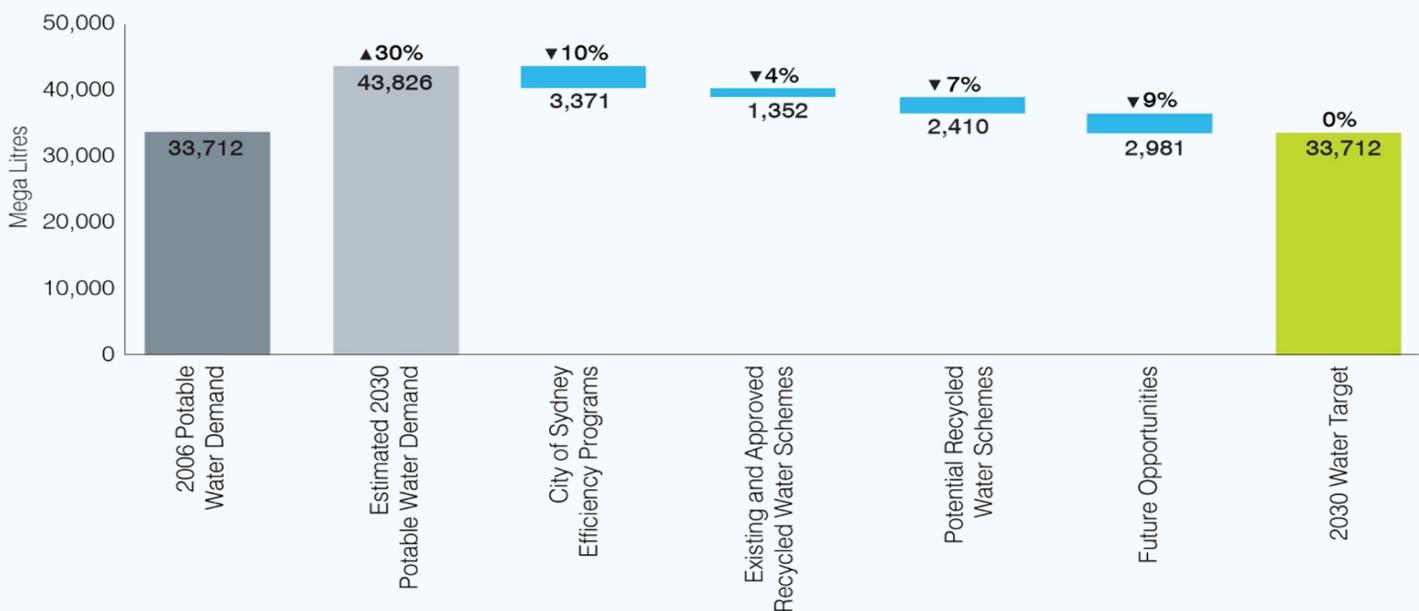
<sup>7</sup> See Delivering to the community on page 49.



## Estimated contribution of initiatives

Chart 7 shows the estimated contributions of the initiatives we believe could minimise the amount of potable water consumed in the local government area by 2030, despite the growth that the area will see in that time. The City of Sydney will take a range of actions to achieve its target of zero increase in potable water use by 2030 from the 2006 baseline, however city-wide water consumption is influenced by a number of factors outside the City's control.

**Chart 7 Local government area potable water use target. Estimated contribution of initiatives.**



Key points are highlighted below:

- City of Sydney efficiency programs (-10 per cent) help residents and business to reduce water consumption
- Existing and approved recycled water schemes (-4 per cent) include the City's stormwater harvesting schemes, and private water recycling schemes, based on operations at full capacity
- Potential recycled water schemes (-7 per cent) reflects opportunities for additional recycled water infrastructure; for example, the potential to include recycled water schemes in urban renewal areas that are redeveloped by the NSW state government
- Even if all identified opportunities for recycled water infrastructure are implemented, 2030 potable water use across the city will likely exceed 2006 levels by around nine per cent. We will need to work with Sydney Water, other government entities and private sector to identify water conservation opportunities, recycling and alternative water supply, to safeguard potable water supply and meet the predicted increased demand on water supplies

## Stormwater quality and pollution reduction

The city has some of the oldest stormwater drainage infra-structure in Australia. Traditionally large pipes and channels remove excess stormwater from the city to minimise flood risk and damage. As population and development increases, there are less pervious areas for stormwater to infiltrate, so storm-water run-off enters our waterways with large amounts of litter, other pollutants and nutrients. By incorporating stormwater management systems such as raingardens, wetlands and swales into our streets and parks, stormwater is slowed and filtered. This reduces pollution in our waterways. Our key water sensitive urban design (WSUD) actions:

- Mandate WSUD in new developments where appropriate
- Retrofit the drainage network with gross pollutant traps to remove litter and large solids from stormwater
- Retrofit public open space with raingardens, swales and wetlands to slow down stormwater flows and reduce pollution
- Incorporate raingardens into road renewal and other streetscape project.

## MUSIC model

The City has developed a model to estimate progress towards reducing pollution entering our local waterways via stormwater run-off generated in our LGA. The model captures information about WSUD initiatives in both the public and private domain, including Sydney Park water reuse scheme, stormwater harvesting schemes, gross pollutant traps and raingardens. The model uses MUSIC (Model for Urban Stormwater Improvement Conceptualisation) software, to predict the performance of stormwater quality management systems and provides the optimal locations for the best use of stormwater water quality devices. It will help the City plan design (at a conceptual level) and report on appropriate urban stormwater management systems for our catchments.

The City now has MUSIC Link for developers to use to design stormwater quality devices in new developments in accordance with the City's Water Quality 2030 targets. This will further reduce stormwater pollutants entering our waterways.



# 6. Climate resilient city



Photo by Katherine Griffiths CITY OF SYDNEY

**The best available scientific evidence tells us that greenhouse gas emissions from human activity, particularly our use of energy from fossil fuels, are contributing to climate change and the change is occurring faster than initially predicted.**

## Climate Adaptation Strategy

The Council endorsed the Climate Adaptation Strategy in 2015 to help us prioritise and plan actions to prepare the city for the environmental, social, cultural and economic impacts of climate change. The strategy, titled “Adaption for Climate Change: A long term strategy for the City of Sydney” can be downloaded from our website. This strategy looks to 2070 to assess, and adapt to, the risks posed by climate change for the city. It focusses on near-term climate adaptation outcomes and actions.

The City is progressing priority actions of the Climate Adaptation Strategy to address impacts including urban heat island effects through the urban canopy planting program and intense storm impacts through floodplain and stormwater management.

## 100 Resilient Cities

The Resilient Sydney Strategy (2018) is the first resilience strategy for metropolitan Sydney which calls for business, government, academia, communities and individuals to lead and work as one city. Resilient Sydney’s vision for Sydney is a metropolis that is connected, inclusive and resilient.

Launched in July 2018, the strategy offers an initial five year plan with key directions, priority flagship actions and 35 actions. Implementation of the Strategy is underway with 12 actions being implemented and five of the 35 actions already completed (as at June 2019). A few examples are provided below.

Direction 4 of the Strategy “Get Ready” is focussed on emergency preparedness. General Managers and CEOs of the councils of metropolitan Sydney came together on 7th March 2019 for a Leaders Emergency Management Symposium, hosted by Resilient Sydney and the NSW Office of Emergency Management for Action 24.



The program has completed a research report, 'Insights into Community Urban Resilience Experiences', in collaboration with the University of Sydney to understand the community impacts of four previous disaster events in Sydney.

Every council of Sydney is being engaged to promote community preparedness and to reduce exposure to hazards through the 'Get Prepared' app in partnership with the Australian Red Cross for Action 23.



Direction 3 of the Strategy focuses on social cohesion and connection for disaster resilience. In delivery of Action 16, Resilient Sydney hosted the 'Disaster Prevention is Social Public' forum with U.S expert Daniel Aldrich on May 16th 2019. Daniel presented to an engaged group of stakeholders from across metropolitan Sydney involved in emergency management and building social cohesion, a great opportunity for alliance building.

As part of Action 18 a number of councils across Sydney, including the City of Sydney engaged in supporting communities to know their neighbours through Neighbour Day initiatives.

In June 2019, Resilient Sydney received the Chief Commissioner's Award at the Greater Sydney Planning Awards. Chief Commissioner Lucy Turnbull AO commended Resilient Sydney stating, "This powerful example of innovation and collaboration has immense potential to create positive change in our metropolis."

Implementation of the Resilient Sydney Strategy is now in full swing.



Photo by Damian Shaw CITY OF SYDNEY



## What we are doing

The City is already actively adapting to climate change. Within our own operations and the city, we have:

**Urban Canopy** – Planted 13,631 new street trees since 2005 and installed 5,940 square metres of landscaping throughout the city's streets this reporting period (see Section 9, Urban Canopy).

**Floodplain management** – In NSW, local councils are responsible for managing flooding. The NSW Government Flood Prone Land Policy assists in determining if development on floodplains is appropriate and sustainable. The Floodplain Development Manual 2005, developed by the NSW Government requires preparation of a Flood Study and a Floodplain Risk Management Study and development and implementation of a Floodplain Risk Management Plan. The City has completed flood studies and floodplain risk management studies for all catchments located within the LGA. Council approved the last of the studies on the 15 August 2016.

A flood implementation plan has been prepared setting future floodplain management works for each catchment (see project update in the next page). Review of the Alexandria Canal and Johnston's Creek Flood Study and Management Study respectively have been undertaken to include the effects of the Green Square Trunk Drain and the effect of bridge raising on flood level in both catchments. These studies were finalised in early 2018 and included the new rainfall revision by AR&R 2019.

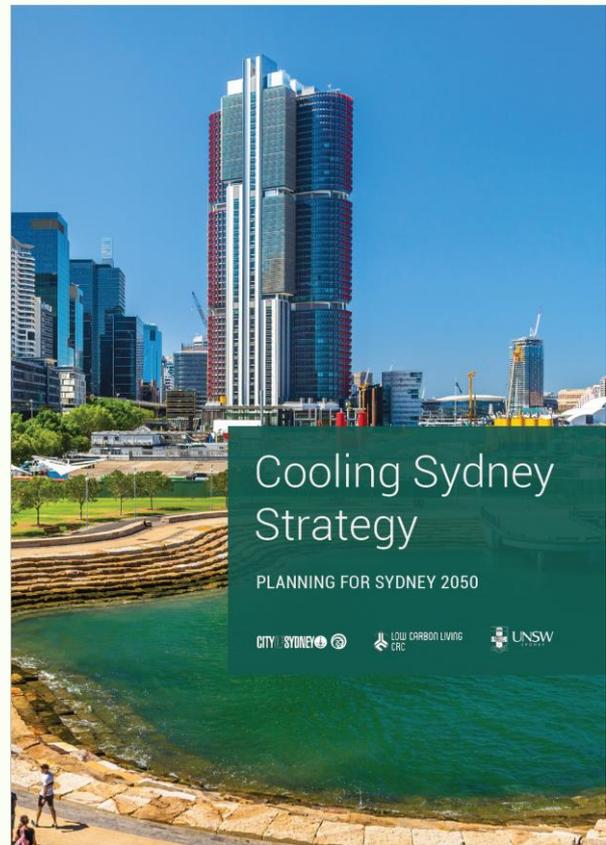
**Stormwater management** – The City has made significant investments in stormwater management infrastructure to mitigate local flooding and improve stormwater water quality for receiving waterbodies (see project update in the next page).

The City continued to assess their stormwater assets with the use of CCTV and implement maintenance and renewal works where appropriate. This process is approximately 40 per cent complete and will be finalised in the FY 2021/22.

## Cooling Sydney Strategy: Planning for Sydney 2050

A key direction of this project and of the planning for Sydney 2050 is to 'live with our climate'. Within this, extreme heat is identified as the one of the primary challenges for Greater Sydney and addressing it requires collaborative action and policy to minimise the associated health risks and resource demands.

Therefore, the purpose of this project and subsequent report is to provide urban overheating mitigation recommendations to support the strategic planning of Sydney 2050 based on in-depth research conducted by the Cooperative Research Centre for Low Carbon Living (CRCLCL) and the University of New South Wales (UNSW).



## C40 Cities Climate Leadership Group

*Created and led by cities, the C40 Cities Climate Leadership Group (C40) represents 94 global cities, 500 million people and one-quarter of the global economy. C40 focusses on driving urban action to reduce emissions and climate risks, while increasing the health, wellbeing and economic opportunities of cities.*



## Project Update

### Green Square Stormwater Drain

Green Square sits on a floodplain and was home to thousands of generations of Aboriginal people amongst a network of ponds, wetlands and creeks that drained to the Cooks River and Botany Bay.

As an industrial area hazardous flooding was a constant challenge, with floodwaters reaching 2.3m in Joynton Avenue during storms in April 2015.

The City, in partnership with Sydney Water formed an alliance with UGL Engineering, Seymour White Constructions, WSP, RPS Mandis Roberts and Rob Carr (the DG Alliance) to build a 2.4km stormwater drain from Link Road in Zetland to the Alexandra Canal, running through the Green Square town centre. The drain now carries floodwaters from South Sydney into Botany Bay.

We helped fund this project because without it, flood risks prevent development. With a flow capacity of 30 cubic metres and a capital value of \$150 million the drain is the largest brownfield urban drainage project in Sydney for 30 years.

The drain route from Link Road to Alexandra Canal was chosen to minimise impact on residents, businesses and the environment. Micro-tunnelling construction technique was chosen to further minimise adverse impact by using a tunnelling machine to install pipes underground without disturbing the surface. Two of the largest commercially available gross pollutant traps in Australia were also installed to treat stormwater runoff and ultimately improve water quality in the Cooks River. The project also involved raising and lengthening Huntley Street Bridge and widening Sheas Creek Channel.

A shared bike path has been built along the Sheas Creek Channel that will provide important recreational and commuting links between the Cooks River, Sydney Airport and destinations such as Sydney Park, Perry Park and Centennial Park to the existing bike network into the city.

A new stormwater harvesting system now diverts water from the drain to the recycling plant in the Green Square Infrastructure Centre within the Community and Creative Precinct in Joynton Avenue. The treated water is now used by thousands of residents in the Green Square town centre.

The project won the Infrastructure Project Innovation Award at the 2019 Australian Water Association NSW Awards.

The Joynton Avenue link is still to be constructed and once complete will finalise the project.

Construction began: February 2015

Expected completion: Late 2019

### Floodplain management

The City of Sydney local government area comprises eight drainage catchment areas: Alexandra Canal, Blackwattle Bay, Centennial Park, City area, Darling Harbour, Johnston's Creek, Rushcutters Bay and Woolloomooloo.

The City finalised all Flood Studies and Floodplain Risk Management Studies in August 2016 with the aid of NSW and Federal Government grants. The Green Square Stormwater Drain, Ashmore Trunk Drain and Joynton Avenue Trunk Drain are three significant projects that have all been instigated as a result of these studies. Sydney Water is working in partnership with the City on several of these projects as they do own a large proportion of the trunk drainage in the City including the Huntley Street Bridge upgrade

Alongside a series of major flood mitigation projects, the City is presently completing a structural and serviceability assessment of the City's 190 kilometres length of pipes, 9204 pits and 2997 junction pits. Investigation of raising the Johnston's Creek bridges to minimise localised flooding along the creek is completed. These results will aid Sydney Water in the redesign of lower reaches of the creek's stormwater channel and in particular the replacement of a concrete bridge near the Tram Sheds. The City has recently commissioned review of the Blackwattle Bay Flood Study and Floodplain Management Study, using the new revised 2019 rainfall conditions.

The City is currently reviewing the Interim Floodplain Management Policy with the view to including future Light Rail and Metro developments.

#### Relevant links

- [Adapting for climate change – a long term strategy for the City of Sydney: 2015-2070](#)
- [Preliminary Resilience Assessment](#)
- [Resilient Sydney: City Context Report](#)
- [Green Square Stormwater Drain map](#)
- [Interim Floodplain Management Policy](#)



# 7. Zero waste city

***Leave Nothing to Waste* is our strategy for managing Sydney's resources to 2030. The City is working to achieve its zero waste target by 2030, with a focus on waste avoidance, reuse and better recycling.**

The City of Sydney area produces more than 5,500 tonnes of waste every day from homes, offices, at the city's many venues and events and during construction of buildings and transport infrastructure. Approximately 69 per cent of all waste is recycled but there are still opportunities to divert and exploit more than 2,000 tonnes which currently goes to landfill each day.

To assist with achieving our zero waste targets the City has identified six priority areas:

- **Promote innovation to avoid waste** – advocate for and assist the city's businesses and community to facilitate innovation and reduce waste
- **Improve recycling outcomes** – optimise the use of existing City services, reduce contamination and explore new services
- **Sustainable design** – increased focus on planning for waste in new developments
- **Clean and clear streets** – maximise amenity improvements and efficiency of waste and recycling
- **Better data management** – improve monitoring, reporting and verification of data
- **Future treatment solutions** – secure long term solution for the treatment of non-recyclable waste using alternative waste treatment technology



## City of Sydney Operations

### Sustainability 2050 Event

The 'Shaping Sydney to 2050 – our city, our future' multi stakeholder event was held on 19 June in the City's Town Hall. The purpose of the event was to engage with government, business, decision-makers, advocates, and community leaders and facilitate their input into Sustainable Sydney 2050.

The event needed to cater for 366 stakeholders. The City Conversations team wanted to produce a zero waste event including the delivery of food and beverages. The event was catered for by Oz Harvest, one of Australia's leading food rescue organisations. Food leftover after the event was donated and any scraps were sent for composting to a local facility.



## Avoiding and Reducing Waste

The City has a commitment to continual improvement when it comes to reducing waste across all of our operations and venues, including events.

The temporary nature of events can often increase our reliance on single use items. Single use items are typically products and packaging that we dispose of after one use. In many instances, these items are not recycled because the type of material used isn't recyclable and/or can't be collected separately.

We have made significant changes to the way we cater for internal and community events. Following are some of our success stories.

### Capital Works launches Dyuralya Square and Perry Park Recreation Centre, March 2019 – reusable coffee cups

The City's Major Events and Festivals (MAJEV) team produced and delivered three Capital Works launches in March 2019. In line with Sustainable Sydney 2030, the City's strategic directions, and MAJEV's goal to be a leader in delivering events and festivals, the team put actions in place for 'no single-use' plastics at the 30 March 2019 launches, with a particular focus on catering products.

After research and discussions with internal stakeholders and suppliers, single-use coffee cups were identified as being ineligible for recycling or composting. Reusable cups seemed the only sustainable option for use at the March launches.

The MAJEV team contracted Ruzi, a local company, to supply reusable bamboo coffee cups, lids and return bins the launches at Dyuralya Square and Perry Park Recreation Centre.

Ruzi provided education to vendors at the launch sites, and signage was installed at key positions including at the coffee carts and bin stations.

Outcomes:

- Attendees appreciated the City was actively promoting sustainable practices
- Coffee providers were positive about serving coffee in reusable cups and educating attendees
- There was a 86 per cent return rate of cups into cup return bins
- Ruzi were extremely impressed with the return rate, particularly as it was a first-time incentive for a public event with open boundaries.

Additionally, at both launches gelato was provided in cones only, doing away with single-use cups and plastic spoons. With these two initiatives, general waste on site was significantly reduced, with almost zero waste produced onsite – a very good outcome.





## Waste Improvement Trial



A waste improvement program was trialled at five of the City's Property sites, which represented a cross section of building types and approximately 50 per cent of the total waste generated. The general improvements included actions such as redesigning the layout of waste stations, updating signage and adjusting the service level and number of bins used at each property.

A food scrap collection trial commenced at two of the properties in November 2018; City's Town Hall House and Pittsway Arcade, a food court that the City manages. From November until May 2019 the average landfill generated per month dropped by 30 per cent. Over 14,000kg of food scraps has been collected from both sites and turned into green energy and nutrient rich fertiliser.

Following on from the trial period a an audit program will be undertaken across all other City of Sydney sites, to inform a future action plan to continue improving waste management for this portfolio.

With the success of the food scraps collection trial it will continue as a standard recycling stream for Town Hall House and Pittsway Arcade. New sites will be identified as part of the rollout of the Waste Improvement Program.

## Street Sweepings Recycling Trial



Street sweepings are largely composed of materials such as organic matter, sand, gravel, glass, metals and plastics – all useful materials in their own right, but useless unless they can be separated. The City of Sydney is participating in a recycling trial with street sweepings collected by

Veolia and processed by Downer at their Rosehill facility to recover useful materials by washing and sorting the sweepings collected from city streets. The recycling process diverts more than 90 per cent of the materials it processes by recovering sand, gravel, grit and rock that can be used in roadbase and asphalt. The organic is separated and composted. To date the City has sent 491 tonnes to the facility.

## Innovation grants

### Addressing Expanded Polystyrene Waste through a Closed Loop System



The Institute for Sustainable Futures (ISF), together with researchers at the University of Technology Sydney (UTS) received a City of Sydney Innovation Grant to assess the feasibility of developing a closed-loop system for recycling Expanded Polystyrene (EPS) using digital technologies such as 3D printing.

EPS packaging was selected as a target material due to the lack of effective collection and reprocessing systems currently in Australia. Owing to the low density of EPS, it is a challenge to handle and transport, takes up considerable space in landfill, and poses a significant litter problem.

The study highlighted how certain systems of provisioning items, such as fresh food and replacing the functional properties of EPS packaging with other products was challenging, however the study found that that it is feasible to recycle campus-sourced EPS into essential products, such as signage, trolleys, and trays for use in the University



## Our operational targets



### Recycling and resource recovery

- 50 per cent resource recovery of waste from City parks, streets and public places by end June 2021
- 70 per cent resource recovery of waste from City managed properties by end June 2021
- 80 per cent resource recovery of construction and demolition waste generated and managed by City operations by end June 2021

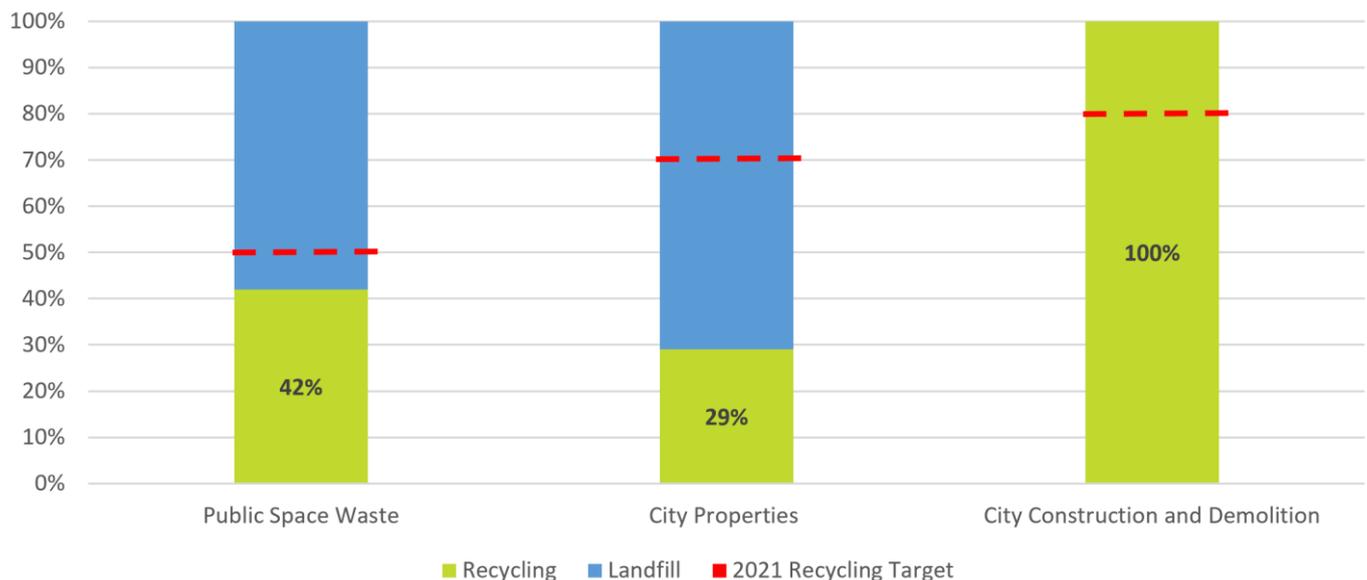
## How we are tracking

Recycling of waste from City parks, streets and public places has increased from 26 per cent to 46 per cent between 2017/18 and 2018/19, closing the gap on our 2021 target of 50 per cent diversion from landfill. The increased recycling rate was the result of changes to waste processing contracts that divert organic waste from public litter and removal of inert materials from the City’s street sweepings and stormwater pit material.

Construction and demolition waste produced by the City increased by 500 tonnes between 2017/18 and 2018/19 as a result of increased project numbers, however our diversion rate remained high at 100 per cent. The City has also developed a mechanism to capture construction waste from our major projects and we will be in position to report on this going forward.

City properties waste has reduced its waste generation by 82 tonnes or 7per cent between 2017/18 and 2018/19. The City has been implementing its Waste Improvement Program across four of its key sites with clear signs of improvement in avoidance and recycling and it is intended to roll these improvements out across all sites.

**Chart 8. City of Sydney operations waste disposal and resource recovery in tonnes (totals Jul-18 to Jun-19)**



- City managed properties waste includes City of Sydney owned and managed buildings where the City has responsibility for the collection and management of the waste generated (approximately 65 buildings and 5 aquatic centres). Due to the timing of this report not all recycling rates could be verified. This data will be updated in the next edition of the Green Report.
- City streets, public place and stormwater waste is not separated for disposal. Separate tonnages are based on waste audit estimates.



## Local government area targets



### Recycling and Resource recovery

- 70 per cent recycling and recovery of commercial and industrial waste from the city by end June 2021
- 70 per cent recycling and recovery of residential waste from the city by end June 2021
- 80 per cent recycling and recovery of construction and demolition waste from the city by end June 2021



## The local government area

### How we are tracking

**Waste minimisation** – since 2015 the per capita annual waste generation rate of our residents has reduced by more than 12 per cent per resident. This means that each of our residents is producing less waste (by weight) each year. The cause of this reduction is likely to be a combination of factors including; light weighting of products through the manufacturing process, home composting, the introduction of the container deposit scheme and more residents taking up waste avoidance initiatives.

**Recycling** – as a result of recent EPA regulation changes the residential waste diversion from landfill has fallen to 48 per cent, and our source separated kerbside recycling rate has remained at 28 per cent, despite an overall reduction of 700 tonnes for the year. The most likely explanation for this reduction is the impact of the container deposit scheme. The City's target is to achieve 35 per cent recycling from source separated collections by 2021. To achieve this, the City is introducing new services

and initiatives to target individual waste streams currently going into the red bin.

The new initiatives include e-waste collections, food waste collection trials and textiles collections.

### Project Update

#### A decade of e-waste recycling!

This year marks a decade since the City commenced its quarterly e-waste drop off events. Since providing the service over 21880 attendees have participated, dropping of 688 tonnes of e-waste at sites in Ultimo, St Peters and most recently at the City's new Alexandra Canal Depot in Alexandria.

Electronic waste generation continues to grow at a rapid pace within Australia. This waste is 95 per cent recyclable as it is made up of valuable resources such as gold, zinc, aluminium, and copper that can be recovered and recycled infinitely.

In 2018/19 the City provided e-waste drop off events each quarter attracting over 3380 attendees, and recycling over 90 tonnes of e-waste. Majority of attendees have been repeat users of the service, demonstrating a commitment to recycling and better environmental outcomes.



## Community education



Community education is a key pillar for building residents capacity to use rubbish and recycling services effectively and contribute towards the goals set by the City. We held waste education stalls at the Good Neighbourhood Community BBQs held across the City, attracting over 1800 attendees. Staff provided resources to residents to help use rubbish and recycling services correctly.

Six community education pop-up events were conducted at social housing estates in Redfern, Glebe, Waterloo and Woolloomooloo. These events were well received by attendees and provided an opportunity for residents to drop off their batteries and lightbulbs and ask questions related to Council rubbish and recycling services.

The City in conjunction with South Sydney Regional Organisation of Councils delivered 17 community education workshops to new migrants and students attending community colleges. The training sessions focussed on helping residents understand the City's services and correct recycling practices.

As part of the Lord Mayor's welcome for over 1000 international students an information stall was held, providing newly arrived students with information relating to Council's rubbish and recycling services.

## Residential Food Scraps Collection Trial

The food scraps recycling trial will commence from 29th July 2019 with about 4,300 households taking part. After conducting site assessments and obtaining strata committee approval, 53 apartment buildings have committed to take part in the trial along with 329 houses across three trial areas across the City for 12 months. These properties will receive their new food scrap recycling bins and starter packs (including a kitchen caddy, bin liners and information brochures) in mid-July.

To make sure residents know how to participate in the trial, information sessions will be conducted at apartment buildings, where residents will have the opportunity to talk to educators about how they can recycle their food scraps.

Our goal is to see less food scraps in the red-lid bin so we are conducting baseline waste audits now, before the trial starts. All collected food scraps from the trial will be taken to EarthPower, a processing facility that uses anaerobic digestion technology to convert the food scraps into green electricity and a nutrient-rich fertiliser. Full details on the trial can be found at [cityofsydney.nsw.gov.au/foodscraps](http://cityofsydney.nsw.gov.au/foodscraps)

## New recycling stickers and signs



To make it easier for residents to know what they can and can't recycle, new bin stickers and bin room signs have been designed for rubbish, recycling, garden organics and bulky household waste collection services. New stickers and signs are installed on residential bins and in bin rooms across the City now.





## Advocacy

### Circular economy

The City supports the development of circular economy approaches to the management of waste and resources, signalling a move away from the traditional linear 'take, make and dispose model'. The City believes that an overhaul of how governments, industry and the community view the value of materials we use, and our collective responsibility to reduce the impact of our consumption habits is required.

The City is advocating for a minimum percentage recycled content and repair targets for all products to help shift responsibility from consumers to product manufacturers.

In Europe governments encourage better product design by differentiating the financial contribution paid by producers under its extended producer responsibility schemes on the basis of the end-of-life costs of their products.

## Promoting Innovation

Environmental initiatives are supported by a number of grants and sponsorships from the City of Sydney. The innovation fund aims to support the development or implementation of new technologies or processes that are currently not being used in the local market, but have the potential to reduce emissions, water or waste and/or improve efficiencies that could be applied across our area.

### Central Park Precinct Organics Management Feasibility Study

The City co-funded a feasibility study of vacuum collection and on-site organic waste treatment to generate energy and produce a nutrient rich fertiliser at the Central Park Precinct in Chippendale, City of Sydney. The study focused on capture and treatment of food waste from residential apartments and commercial retailers, used cooking oil, fats and grease and sewage sludge. The potential energy generation from on-site treatment of organics was estimated to be between 11 per cent and 19 per cent of the total demand from the Central Park apartments.

### Relevant links

- [Leave Nothing to Waste, City of Sydney Waste Strategy](#)
- [Waste Management Local Approvals Policy](#)





# 8. Active and connected city

**The City is committed to promoting the most sustainable modes of transport for residents, workers and visitors.**

## City of Sydney Operations

### Fleet emissions

The City's motor vehicle fleet is a leader in the logistics industry and has continued to address greenhouse gas emissions through its Sustainable Fleet Management Program. The Program is focussed on maintaining emissions at 2013/14 levels by further reducing fuel use until new low-emission products and technologies become available in Australia.

The City's fleet has continued to reduce its size, balancing vehicle numbers with the demands placed on providing essential services to residents, workers and visitors.

The combined fleet emissions for Q3 and Q4 2018/19 were 86 tCO<sub>2</sub>-e less than the same period last year, and the annual total remains below the target level.

Blended bio-diesel continues to be the prime fuel type used by the City's diesel and diesel hybrid motor vehicle fleet. Petrol hybrids use Shell Unleaded E10 exclusively.

### Telematics

A tender is underway to install telematics technology across the City's vehicle and major plant fleet. The implementation of this technology will assist the City with driver safety, environmental efficiencies and legal compliance.

Through telematics, the City will gain an understanding of our driver behaviours that contribute to excess emissions, such as harsh acceleration, harsh braking, harsh cornering and speeding - enabling driver training programs to be even more focused on techniques which will help our drivers become both safer and more fuel efficient users of fleet vehicles.

Gaining quality data through telematics will assist the Fleet team and its internal customers to make more informed decisions on efficiencies and strategy moving forward. Valuable data will be collected and analysed, helping both Fleet and customers with business efficiencies, workflow planning and route optimisation which will help to further reducing our overall emissions.

The project implementation for vehicle telematics is on track for 2nd quarter of 2019/2020.



### Our Operational Targets



**Fleet emissions**

– Zero increase in emissions from the City's fleet of vehicles by 2021, from 2014 levels



**Electric Vehicle News**

The City is in the process of replacement planning for 19 new fully electric vehicles. The 19 vehicles earmarked for disposal will be replaced with the all new Nissan Leaf, which is fully electric with zero tailpipe emissions.

The Leaf has an average range of 270kms, which can increase with urban driving thanks to regenerative power through city driving, and the all new e-pedal. The Leaf comes packed with lots of safety features and new technology including Apple Carplay and an 8 inch touch screen display, voice recognition, Bluetooth and satellite navigation.

The City will also be upgrading the charge points for it's electric fleet from type 1 to type 2 to align itself with the electric vehicle industry, which is now producing all new vehicles with type 2 connectivity as standard, bringing better reliability and faster charging capabilities.

The arrival of the City's new electric fleet is expected in the coming months.

**Active transport**

City staff continue to embrace greener transport options and are increasingly choosing to walk, cycle or use public transport to commute to work and travel within their working day.

City staff plan their travel using a simple transport hierarchy:

- Active Transport (walking or cycling using the City's own bike fleet)
- Public Transport (buses and trains)
- Drive Green (the City's own fleet of low and zero emissions vehicles)

To support the use of active transport, staff are encouraged to use the City of Sydney's bicycle fleet in preference to fleet cars and taxis. The bike fleet includes a range of bikes suited to various operational requirements, including a cargo bike, some electric assist

bikes and bikes with additional carrying capacity. Before using the fleet, staff members take part in a cycling confidence course and are provided with personal protective equipment, and are encouraged to build their cycling skills with regular group rides.

Eight new e-bikes were added to the City's fleet this year, to help staff travel to meetings, between City venues, and for site visits.

Most of the City's bike fleet is housed in our end-of-trip facility provided for staff who walk or ride to work, or exercising during work hours. The Pitstop includes 150 bike parking spaces, 150 lockers, ensuite and accessible bathrooms, showers, change rooms and a water station.

Since opening on 13 October 2014 an average of 94 people have accessed the Pitstop daily. There are a total of 26 fleet bikes located at a variety of Council facilities including King George Recreational Centre, Epsom Rd and Bay St Depots. The fleet has travelled more than 52,000 kilometres since 2011.

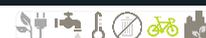
The following table shows the kilometres travelled by staff using the City Bike Fleet since its introduction in January 2012 and the number of staff members who have completed training to enable them to use the bike fleet. Distances travelled are measured using odometers mounted on each bike.

We piloted a new program Walk or Wheel Wednesday with six local schools. The program encourages local primary school children to ride or walk to school. The City provided marketing materials and resources to help schools promote the program.

We also supported National Ride2School Day in March 2019, with a pop-up event at Darlinghurst Public School. The City provided free bike tune ups, fruit, maps and honker hooters to children. Maps and honker hooters were also shared with Newtown Public School who also requested some support.

We piloted workplace cycling courses with local businesses. The team building courses encourage staff to try electric bikes in a safe environment with familiar faces.

| Bike Fleet      | 18/19 Q1 | 18/19 Q2 | 18/19 Q3 | 18/19 Q4 | Year to date | Program to date |
|-----------------|----------|----------|----------|----------|--------------|-----------------|
| Staff trained # | 10       | 18       | 15       | 20       | 63           | 728             |
| Distance (km)   | 4,259    | 2,041    | 2,049    | 2,539    | 10,888       | 50,035          |



## The local government area

### Local government area targets

|  |  |
|--|--|
|  <b>Walking</b>          | – 33 per cent of trips to work during the AM peak undertaken by walking by 2030, by city residents   |
|  <b>Cycling</b>          | – 10 per cent of total trips made in the city are undertaken by bicycle by 2030  |
|  <b>Public transport</b> | – 80 per cent of trips to work during the AM peak are undertaken by public transport by 2030, by city residents and those travelling to Central Sydney from elsewhere  |
|  <b>Car sharing</b>      | <ul style="list-style-type: none"> <li>– 30 per cent of city residents who drive with an unrestricted drivers licence are members of a car sharing scheme by 2030</li> <li>– Increase the number of car share bookings</li> <li>– Increase the number of on-street car share parking spaces</li> </ul> |

## Walking

Walking is a low cost, reliable, healthy and environmentally friendly transport option. Research confirms that walking already accounts for around 90 per cent of trips in the city centre and plays a major role in the local transport hierarchy.

The City continues to work to ensure that our built environment is designed to encourage residents and commuters to undertake short trips on foot.

The City recognises the importance of a safe walking environment. The City has been continuously working to improve pedestrian safety, including advocating the NSW Government, throughout the city.

Some of the City's achievements to improve pedestrian safety include prioritising walking and cycling in new developments like Green Square and Ashmore, upgrading and widening footpaths (such as recently at Foveaux Street), installing new footpath lighting and street furniture, successfully advocating for improved pedestrian amenity along George Street, advocating for reduced waiting times for pedestrians at signalised intersections throughout the city centre (with Transport for NSW recently agreeing to reduce the wait time from 110 to 90 seconds at many intersections), and advocating for reduced traffic speeds throughout the city and local centres (including 40 km/h zones).

In our urban renewal areas we are designing walkable and liveable streets and places, ensuring new development provides new walking links. In Green Square we announced three pedestrian-only streets for the town

centre, creating traffic free plazas for dining, relaxing and connecting to local shops and transport.

We launched the new Rainbow Crossing in Taylor Square – a trial painted road surface celebrating the local community and a new pedestrian priority zone. VIP's joined around 100 people gathered for the February celebration. The launch was so successful it became a Twitter 'moment'. We produced signage and safety messaging, along with an on-ground decal marking the best 'selfie spot'.

The City is developing prototypes of new automated pedestrian counters to provide 24/7 data about where, when and how people are walking. The new smart counters will replace manual counts conducted twice per year across 100 sites. The Smart Mobility project received \$340k matched cash funding from the Federal Government Smart Cities program, run by the Department of Industry, Innovation and Science.

Works began to replace the Cutler Footway. The footway links Burton Street, Darlinghurst, and MacDonald Street, Paddington. It will be replaced with a new wider footway for people walking and riding, new safety barriers, lighting and signs. The Burton Street viaduct arches below will also be repaired.

The City's rollout of an \$8 million Legible Sydney Wayfinding System is helping people get around Sydney with pedestrian-friendly maps, information pylons, new signs and digital technology. Over 600 signs, including 2,100 braille and tactile street signs will be installed across our local area by the end of the year.



## Cycling

The City's Cycling Strategy and Action Plan (2018-2030) sets ambitious targets for the City to substantially complete 11 regional routes to link the inner city, homes, schools, businesses and other destinations. The Strategy guides projects and programs to help more people ride bikes in Sydney. It prioritises connecting the bike network, supporting business and people to ride and lead by example.

Dockless bikes continue to be popular in Sydney, providing a sustainable transport option for thousands of people. Share bikes can help fill transport gaps, free up space on the roads for people who need to drive, reduce air and noise pollution and improve health and wellbeing.

Since late November 2018, over 80,000 people registered 435,000 Lime e-bike trips spanning 5 million minutes. While in its first 12 months, Mobike reported over half a million rides with bikes turning over more than 6 times a day in some Sydney hotspots.

We work closely with operators in Sydney and other local councils on bike share guidelines and proactively manage issues around considerate parking.

### Project Updates

- In Green Square, we opened the Gadigal Avenue Cycleway between Lachlan and O'Dea Streets at the Dyuralya Square launch event. We provided bike tune-ups to people riding, many of them local residents. Many commented on the quality of bike infrastructure in the local area and that a car was not necessary.
- Construction is underway on the Epsom Road cycleway in Green Square. The cycleway will form an important missing link for people riding between Green Square and Randwick.
- A new cycleway is under construction on Wilson Street, Newtown which is a priority NSW Government cycling route and one of our key regional bike routes across the city. Approximately 9,000 bike trips occur each week on Wilson Street, and new separated cycleways will make these journeys significantly safer.

|                                      | Q1  | Q2  | Q3   | Q4   | Year to date |
|--------------------------------------|-----|-----|------|------|--------------|
| Share the Path sessions              | 36  | 24  | 21   | 28   | 60           |
| STP Tune Ups (#)                     | 351 | 305 | 195  | 411  | 656          |
| STP maps issued (#)                  | 970 | 819 | 577  | 1164 | 1789         |
| STP bells issued (#)                 | 341 | 160 | 131  | 229  | 501          |
| Cycling courses (# participants)     | 44  | 43  | 3535 | 2525 | 147          |
| Maintenance courses (# participants) | 58  | 28  | 3535 | 2525 | 146          |
| Balance Bike Clinic                  | 999 | 470 | 933  | 1180 | 3582         |



## Public transport

The City continued to work with Transport for NSW to improve transport infrastructure and services across the City of Sydney, with particular emphasis on the City Centre, Green Square and Ashmore.

The City is collaborating with Transport for NSW on a Green Square and Waterloo Transport Action Plan. This will focus on implementation of actions in the five year timeframe that will address current transport and access issues e.g. improving bus priority on routes to the City Centre.

The proposed Metro West remains a centrepiece of the NSW Government's plans. It will support the growth of both Sydney and Parramatta, renewal elsewhere in the City, and increase capacity on rail lines serving the City Centre. The City is actively engaged in planning route and station location options, including arguing the case for stations at Pyrmont and Zetland in Stage 1 (ideally by 2028).

The City made representations to the Australian Government to ensure the national importance of improved connections between the City Centre, Green Square and Southern Sydney was reflected in the national infrastructure priority list.

City Access and Transport addresses transport and land use integration by providing strategic transport advice and advocacy on major developments in the city.

Consistent with the Sydney City Centre Access Strategy, the City works with the CBD Coordination Office to address the roadscape and kerbspace issues arising from the construction of light rail and the transformation of George Street.

The City has continued to work closely with Transport for NSW on the CBD and South East Light Rail. The Light Rail will travel from Circular Quay along George Street to Central Station and on to Moore Park, then to Kingsford via Anzac Parade and Randwick via Alison Road and High Street.

## Events & Campaigns Update

- The City ran a targeted campaign in Green Square, encouraging residents to travel by bike
- The campaign included advertising at the busiest bus stops in the area as identified through Opal data
- Posters included information on the time, distance and cost savings made by travelling by bike as well as a detailed description of the route map
- A 1-minute video was also created to highlight the ride to the city from Green Square. This was distributed across social media.
- The campaign also included a try-a-bike event in Green Square. 150 local residents took part in the free community event encouraging new riders with the opportunity to go for short ride around the area,
- A free guided tour took place to highlight the ride into the city and back. This ride was fully booked with 20 participants.
- We also continued our basic and intermediate bike maintenance courses and our popular balance bike clinics for kids, which take place at Sydney Park Cycling Centre.







# 9. Green and cool city

**Dealing with heat is identified as a priority for reducing shocks and stresses on our city and its community. Greening our city is an important component of the Sustainable Sydney 2030 vision to be green, global and connected.**

The Cooperative Research Centre for Low Carbon Living (CRCLCL) and the University of NSW (UNSW) with the City of Sydney have released the [Cooling Sydney Strategy: Planning for Sydney 2050](#) which provides the first strategic direction for the city to live with our changing climate.

Reducing the effects of urban heat through measures such as increasing shading and canopy, water misting, and careful selection of building and road materials are increasingly important to reduce the overall heat impacts for our communities. We are also focussed on increasing and preserving local indigenous plant and animal populations in our city, through parks and streets verges.

The City maintains sensors in City locations that measure temperature and humidity to collect locally specific background data to monitor and evaluate the effectiveness of urban heat treatments.

The City is involved in leading research into urban heat impacts and opportunities is through the Cooperative Research Centre for Low Carbon Living who are developing an urban heat decision tool and index. The City is also involved with the Cool Cities network of the C40 and the Resilient Sydney program, to learn and share best practice with other jurisdictions.

A collaborative effort between the City, the community and other land managers is needed to improve our city's urban canopy and ecological value. We will continue to work with our community and others in the city to deliver this commitment.



## City of Sydney Operations

### What we are doing

The City has programs and measures to increase canopy cover, habitat linkages and native plant and animal species in its open spaces and streetscapes. We have:

- Planted thousands of new street trees since 2005 and installed landscaping and additional plants throughout the city's streets and parks
- Provided annual floral displays and hanging baskets in areas with no landscaping or planting through the City's Living Colour program
- Planted thousands of native plants and increased habitat across our bush restoration sites since 2015
- Upgraded 73 small parks since 2008 and installed 249 raingardens

### How we are tracking

The City's canopy cover was 15.5 per cent in 2008, 17.1 per cent in 2013, and preliminary analysis has found a canopy cover of 18.1 per cent in 2019. Whilst the City is one of the few councils in Sydney that has managed to increase canopy cover over this time, we need the rate of canopy cover growth to increase more quickly to meet the urban canopy target of 23 per cent by 2030.

Progress against our fauna targets will be measured formally every five years through a comprehensive survey. Bush restoration sites in the city have increased to 12.3ha, from the baseline of 4.6ha in 2012.



## Our operational targets

|   |   |
|---|---|
|  <b>Urban canopy</b>    | <ul style="list-style-type: none"> <li>– The average total canopy cover is increased by 50 per cent by 2030 (from 15 to 23 per cent), and increased by 75 per cent by 2050 (to 27 per cent), from a 2008 baseline</li> <li>– Plant 700 street trees each year until 2021</li> <li>– Tree species diversity will not consist of more than 40 per cent for any particular plant family, 30 per cent for any genus or 10 per cent for any one species by 2021</li> </ul>                                     |
|  <b>Urban ecology</b>   | <ul style="list-style-type: none"> <li>– Habitat sites in the city are protected and the area of bush restoration sites is increased by 100 per cent by 2023 from a 2012 baseline of 4.6 hectares</li> <li>– Indigenous fauna species diversity, abundance and distribution is maintained or increased by 2023 based on a 2012 baseline</li> <li>– A progressive increase in the number of habitat features for priority fauna species is established along potential habitat linkages by 2023</li> </ul> |
|  <b>Urban greening</b> | <ul style="list-style-type: none"> <li>– Plant 50,000 new trees and shrubs in City parks and street gardens each year until 2021</li> </ul>   |

## Local government area target

|  |  |
|--|--|
|  <b>Urban canopy</b> | <ul style="list-style-type: none"> <li>– The average total canopy cover is increased by 50 per cent by 2030 (from 15 to 23 per cent), and increased by 75 per cent by 2050 (to 27 per cent), from a 2008 baseline</li> </ul> |
|--|--|



## The local government area

The City of Sydney recognises the importance of trees and other plants in providing significant environmental, social and economic benefits for the community. There is growing international recognition of the role of cities and local governments in supporting and promoting biodiversity.

The City is committed to increasing tree coverage, improving urban ecology and biodiversity and supporting community greening to make Sydney one of the world's leading green cities. To achieve this, the City has developed the Greening Sydney Plan.

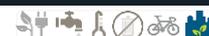
The Plan acknowledges the importance of ecology and biodiversity to city living and supports the development of the Urban Ecology Strategic Action Plan.

Three strategic focus areas have been identified informing the objectives and targets of the Plan:

- **Urban Canopy** - developing and protecting the city's urban forest
- **Urban Ecology** - greening to improve habitat for biodiversity
- **Community Empowerment** - to green and care for our urban landscape

## Relevant links

- [Greening Sydney Plan: 2012](#)



## Urban canopy

The City of Sydney recognises that trees and green spaces are one of a city's most important natural assets. They are crucial to maintaining the high quality of our public realm and achieving Sustainable Sydney 2030, by assisting the creation of green corridors and increased canopy cover.

The in-road tree planting projects at Bowman Street Pyrmont, Morehead Street Waterloo, Ripon Way and Primrose Avenue Rosebery and streets in Chippendale. Design work continues for more streets in Glebe and Rosebery.

This planting is undertaken as part of the City's Street Tree Master Plan 2011<sup>8</sup>, which is a blueprint for street tree plantings across the City of Sydney.

The City is continuing to deliver a number of small parks upgrades within the LGA. Since 2008, 73 small parks have been completed, including two completed during Q1 and Q2 in 2018/19 and several more currently being planned. New parks have been completed at Frances Newton Reserve, Darlinghurst and Duralya Square, Green Square. Minor improvements were also delivered in Redfern Park skate and Sydney Park. Planning and design for over 20 park renewal projects are currently underway. A further 8 small parks across the local government area will commence design in 19/20, with delivery over the next three years.

Under the Greening Sydney program various areas have been converted to increase the vegetated space within the City. During Q3 and Q4 in 2018/19 2,933 m<sup>2</sup> of landscaping (grass and planting installation) was completed. Major planting works were completed at Hyde Park, CBD, Dr H J Foley Rest Park, Glebe, Telopea Street, Redfern, Phillip Street, Redfern, Defries Ave, Zetland and McElhorne Reserve, Elizabeth Bay.

Raingardens are one of the simplest forms of Water Sensitive Urban Design (WSUD), improving water quality and managing runoff to improve biodiversity and the liveability of urban environments. 249 raingardens have been installed to date.



<sup>8</sup> <http://www.cityofsydney.nsw.gov.au/live/trees/tree-policies>

| Description  | Q3<br>18/19 | Q4<br>18/19 | 18/19<br>target | Year to<br>date | Total to<br>date |
|--|-------------|-------------|-----------------|-----------------|------------------|
| Small park upgrades (#)                                  | 0           | 0           | 3               | 2               | 73               |
| Landscaping (grass/planting) (m <sup>2</sup> )           | 1,865       | 1,068       | 8,000           | 5,940           | 229,529          |
| New shrubs and grasses planted in City parks and streets | 12,291      | 25,043      | 50,000          | 69,708          |                  |
| Raingardens (#)  | N/A         | N/A         | trend           | N/A             | 249              |
| Street trees planted since 2005 (#)                      | 88          | 443         | 700             | 784             | 13,631           |

| Description                    | Q3<br>18/19 | Q4<br>18/19 | 2030<br>target | Year to<br>date | Total to<br>date |
|--------------------------------|-------------|-------------|----------------|-----------------|------------------|
| Canopy cover (on current) (%)* | N/A         | N/A         | 23.5           | 0.6             | 18.1             |

Please note numbers on the table above are compiled from various sources and may include adjusted totals as more accurate data is received.

\* Canopy cover is measured every five years. 2013 data was made available in 2016, with new measurement undertaken in late 2017, and the data shown in the table above.

## Relevant links

- [City of Sydney Street Trees](#)
- [Sydney's Green Streets](#)
- [Urban Forest Strategy: 2013](#)



Photo: 'Budding Birdos', community members participating in the Sydney Park community bird monitoring program.



Photo: 'Native bee hive' in a bush restoration site.

## Urban Ecology

The ecological health of urban areas influences not only the diversity and abundance of plant and animal species, but also the quality of life of urban residents. Improved urban ecosystems can consequently have both environmental and social benefits.

The City's Urban Ecology Strategic Action Plan (UESAP) was adopted by Council in March 2014. The Plan outlines the City's approach to identify, protect and rebuild locally indigenous plant and animal populations.

The City has engaged their first Bush Regeneration Contract alongside its Parks and Open Space Maintenance contract. The contract will be in place for three years. This new contract will further improve the condition of bush restoration sites found across our parks by increasing the diversity of local flora and their habitat value. The contract will also assist in improving habitat linkages across the LGA.

A Sydney Park community bird monitoring program commenced in 2019 to harness the growing interest in the wetland and its birdlife. Twelve community members have signed up to attend workshops and field trips across 11 months. The program is carried out in partnership with Birdlife Australia. Two workshops in Sydney Park and a field trip to Scheyville National Park have been attended, with three remaining workshops and activities throughout National Bird Week.

The City has developed a Habitat Creation Guide for the community. The guide provides general information about urban biodiversity and has many tips to create habitat gardens and habitat balcony gardens in the community. The guide has been distributed across our community centres and libraries and is provided at various events.

The City has also developed its first Australian White Ibis Plan of Management for the LGA. The purpose of this Plan of Management is to outline appropriate management for ibis within the City of Sydney Council local government area. It was developed with consideration to the values of each site, the views of key internal stakeholders, management issues and legislative requirements.

A nest box and hollow strategy has been finalised for the City to consider its implementation over the next three years. Consultants were engaged to assess the current nest box and hollow availability and provide recommendations on suitable sites and opportunities for the City to consider.

Three native bee hives have been installed in bush restoration sites across the LGA as a trial. The hives are in volunteer sites so that the volunteers are able to report on any vandalism or failures of the hives. To date, the hives have survived and the installation of additional hives will be carried out at the end of the 2019.

## Relevant links

- [Urban Ecology Strategic Action Plan 2014](#)



**Community Empowerment**

**Community gardens and community planting**

The City recognises that community gardening offers residents the opportunity to grow and harvest their own organic vegetables, herbs and flowers and helping reduce household waste through community composting. Community gardens also bring people together to transform knowledge and skills into harmonious demonstration spaces within our city.

The City continues to support and implement community gardens in the local government area, with 20 gardens, two community footpath verge gardens and one community composting group in place at the end of June 2018.

We have established one new community garden at the Lawrence Hargraves Reserve Kings Cross Community

Garden, with two more on their way at Frances Newtown Reserve Palmer St Community Garden and Cowper St Community Garden

The City also supports five Bushcare groups who play a vital role in restoring bushland areas by undertaking weeding, litter removal and tubestock planting.

Community planting events happen throughout the year to assist existing Bushcare groups or to green open spaces by inviting the local residents and community to participate in planting native seedlings.

**Relevant links**

- [City of Sydney Community Gardens](#)
- [City of Sydney Bushcare](#)

| Performance                          | Q3 18/19 | Q4 18/19 | 18/19 target | Year to date | Total to date |
|--------------------------------------|----------|----------|--------------|--------------|---------------|
| Community Gardens (#)                | No new   | 1        | >18          | 1 New        | 20            |
| Landcare groups (#)                  | No new   | No New   | trend        | No new       | 5             |
| Community footpath verge gardens (#) | No new   | -1       | trend        | No new       | 2             |
| Community composting groups (#)      | No new   | No new   | trend        | No new       | 1             |



Photo: Lawrence Hargraves Community Garden



### Green roofs and walls

Green roofs and walls make an important contribution to the urban environment. They help mitigate the impacts of the urban heat island effect, slow and clean stormwater, improve air quality, increase habitat for biodiversity and create additional space for urban food production and recreation. The Green Roofs and Walls Policy – the first of its kind in Australia, was formally adopted by the Council in 2014.

The City has developed resources to inform, inspire and encourage building owners to include green roofs and walls in their developments. These include a guide to waterproofing for green roofs and walls, a green roofs and walls inspiration guide and case studies showcasing two of the City’s own green roof projects, Surry Hills Library and Beare Park amenities block. The City’s work on green roofs and walls, including the policy, guidelines and its own green roofs and walls, was ‘highly commended’ in the NSW Government’s Green Globe Awards in October 2015.

The guides, case studies and more can be downloaded from [www.cityofsydney.nsw.gov.au/green-roofs-and-walls](http://www.cityofsydney.nsw.gov.au/green-roofs-and-walls)

Significant development is occurring in the City and has resulted in a jump in the number of green roofs and walls. In 2018/19, the City received 30 new development applications which included green roofs or walls. Currently the City has at least 151,107 m<sup>2</sup> of green roofs and walls. 2018 saw green roofs and walls of about 15,017 m<sup>2</sup> completed on 10 properties.

| Performance                     | 17/18<br>new sites | 18/19<br>new sites | Total<br>to date <sup>9</sup> | Total area<br>(m <sup>2</sup> ) |
|---------------------------------|--------------------|--------------------|-------------------------------|---------------------------------|
| Green roofs in the LGA (#)      | 13                 | 11                 | 151                           | 147,645                         |
| Green walls in the LGA (#)      | 2                  | 1                  | 43                            | 4,040                           |
| Total green roofs and walls (#) | 15                 | 10                 | 192                           | 151,107                         |

### Relevant links

- [Green Roofs and Walls](#)

<sup>9</sup> 2012/13 was the first year of measurement.



# 10. Delivering to the Community



## Highlights

Sydney's business and commercial office property industries are already leaders in built environment performance, and now the City of Sydney is working with the sector to increase its ambition and urgency, and move towards a carbon positive future. CitySwitch and Better Buildings Partnership members were given a pathway and mandate for accelerated action on renewable energy and net zero emissions, in August, at the Towards Carbon Positive event.

### Pledge to eliminate single use items

In May 2019 the City's Sustainability Programs team launched the Sydney Single Use Pledge. Businesses from the Sustainable Destination Partnership, Better Buildings Partnership and CitySwitch joined together to commit to eliminating single-use items in their businesses and buildings. So far 55 organisations have signed the pledge, with more expected to join.

The commitment means there will be fewer plastic bottles, straws, throwaway cups and food utensils at a growing number of Sydney hotels, entertainment venues, markets, festivals, major events and outdoor spaces.

The City has taken a platinum pledge, committing to phasing out 7 single-use items in its buildings, at its own venues and at events within our area. The City will eliminate or reduce the use of: Single use bottled water, plastic straws, serveware and utensils, promotional flyers, single use sampling / giveaways and single use cups

The City has developed guidelines to help find sustainable alternatives to single-use items and ensure that where waste is generated, recycling is maximised.

The pledge was launched with a successful event designed to provide inspiration and practical advice from community leaders to help pledgers to take action. Through May and June CitySwitch ran their Choose.Reuse campaign to support avoidance of coffee cups and lunch containers. Even more resources and activations are planned for release over the coming quarter.



**Business Sector - Program Update**

**CitySwitch Green Office NATIONAL**

The 2018 CitySwitch annual program report announced that CitySwitch signatories across Australia achieved a reduction of 86,979 tonnes of emissions from energy efficiency improvements, and a further 624,087 tonnes of emissions were abated through the purchase of carbon offsets.

The CitySwitch annual conference was held in March, which brought the national Program Managers and the National Steering Committee together in Sydney to contribute to program and campaign planning, share knowledge and insights, and partake in technical training.

Additional resources and campaigns were made available online, including 10 new 'beginner guides'. Two new campaigns have been created and implemented to support the updated program commitments; "Bring Your Best Self" is a behaviour change campaign designed to encourage healthy offices and wellness, and "Expand the Band" is a campaign for building managers and companies that promotes adjusting office temperatures for occupant comfort and to reduce greenhouse gas emissions.

CitySwitch also developed and delivered a suite of waste engagement campaigns to focus occupants on the need to avoid creating unnecessary waste and to encourage improved separation for better resource recovery. These are rolling out between May and September.

| Performance - Cumulative                                | Q3 18/19  | Q4 18/19  |
|---|-----------|-----------|
| Signatories (#)   | 606       | 616       |
| Tenancies (#)   | 904       | 938       |
| Office floor Space - NLA (m2)                           | 4,009,281 | 4,195,428 |
| Percentage of all Australian office space <sup>10</sup> | 16        | 16.7      |
| Average NABERS Energy rating (stars)                    | 4.4       | 4.4       |

**Relevant links**

[CitySwitch Green Office](#)

**Business Sector - Program Update**

**CitySwitch Green Office SYDNEY**

The focus of the past 6 months has been a deep dive engagement with CitySwitch signatories and companies participating in the Better Buildings Cup. The program manager has been helping to develop effective working groups within each participating building, and to increase the shared ambition for net zero waste and emissions. The implementation of the Better Buildings Cup provides a structured way for CitySwitch to increase its influence and help companies to come together to work on a range of projects and campaigns. Projects already carried out include foyer activations and information sessions for staff, new rooftop and in-building gardens, new tenant working groups, and waste project development.

Collaborating with other City programs, a booked out cross-sectoral event was held in May to help Eliminate Single Use, including the launch of the Sydney Single Use Pledge. 93 companies from a range of sectors attended to share insights as to how to avoid and eliminate up to seven streams of waste in their buildings and businesses. The event was packed with case studies from community and business leaders and practical advice. It was complemented by the launch of the Choose.Reuse campaign which ran through June and July.

| Performance - Cumulative                                     | Q3 18/19  | Q4 18/19  |
|--|-----------|-----------|
| Signatories (#)  | 131       | 135       |
| Tenancies (#)  | 153       | 158       |
| Office floor space NLA (m2)                                  | 1,085,731 | 1,112,956 |
| Office floor space as proportion of Sydney (%) <sup>11</sup> | 21.4      | 21.9      |
| Average NABERS energy rating (stars)                         | -         | 4.7       |

<sup>10</sup> Based on 25.1 million NLA m2 total per Property Council of Australia, Office Market Report 2016

<sup>11</sup> Based on 5.1 million NLA m<sup>2</sup> total per Property Council of Australia, Office Market Report 2016



## Business Sector - Program Update

### Better Buildings Partnership

The Better Buildings Partnership has named 2019 as the year of the customer. In March the program launched an innovative pilot program called the Better Buildings Cup. The Cup is a new kind of competition between buildings that uses games, activities and prizes to unlock sustainability action and increased collaboration between building managers, companies and their staff. So far 53 companies across 6 buildings have undertaken 1100 activities to reduce energy, emission and waste in their buildings.

The Partnership continued to advocate for improved resource recovery, supporting the launch of the National Australian Built Environment Rating Systems (NABERS) new waste tool to better track the resources leaving their buildings. The Partnership worked with the Green Building Council of Australia to encourage demand for recycled materials in the construction sector through the Green Star Rating tools.

#### Relevant links

[Better Buildings Partnership](#)

## Sustainable Office Sector Plan

Sydney's Sustainable Office Buildings Plan was adopted by Council in 2018 and highlights 35 actions to achieving more sustainable buildings across the office sector.

The City has collaborated with sector stakeholders to achieve the following:

- Championed the expansion of the federal Commercial Building Disclosure program to include smaller buildings and office tenants
- Collaborated with national peak bodies to develop a shared position on an integrated policy framework to drive continuous improvement of environmental performance
- Supported over 200 net zero targets and commitments to be set by businesses in the Local Government Area

## Business Sector - Program Update

### Building Tune Up Program Pilot

The Building Tune-Up program has been run as a pilot from January to June 2019 and has engaged 15 buildings from the commercial office and accommodation and entertainment sectors. The pilot has tested low-cost, highly-streamlined approaches to energy, water and waste efficiency opportunity assessments at these buildings. Early indications show substantial potential for low and no-cost optimisation opportunities that will save energy, water, waste and will significantly reduce carbon emissions.

The pilot has also supported the installation of 'Building Data Analytics' systems which provide building operators with real-time data and insights on their building's resource consumption, indoor environmental quality and asset performance. These analytics systems allow for up-to-the-minute optimisation of building performance and are empowering local building managers to make data-driven decisions that deliver significant savings.

#### Relevant links

[Building Tune Up](#)

## Making Sydney a Sustainable Destination Plan

Making Sydney a Sustainable Destination Plan was adopted by Council in 2018 and highlights 28 actions to achieving more sustainable buildings across the accommodation and entertainment sector.

The City has collaborated with sector stakeholders to achieve the following:

- Sydney ranked 9<sup>th</sup> on the Global Destination Sustainability Index in 2018, up from 15<sup>th</sup> place in previous year
- 13 accommodation and entertainment buildings received grant funding to support their first third party environmental performance rating or energy audit
- engagement with corporate and government travel buyers to include environmental rating requirements in their accommodation Request For Proposals (RFPs)



## Sustainable Destination Partnership

Since its launch in June 2018 the Sustainable Destination Partnership (SDP) has baselined the environmental impact of its 55 properties and defined targets for its collective work. This new annual framework includes targets for resource use as well as qualitative measures to build capability and capacity across the sector to address sustainability challenges.

The Partnership also commenced work on avoiding food waste. Current food management practices were reviewed and existing tools tested. This work defined what best practice in food waste management looks like and the next steps in embedding that in Partnership properties. Mapping common suppliers across the Partnership's supply chains has identified opportunities to use collective purchasing power to achieve sustainable outcomes in waste management and laundry services.

The Partnership was also a driving force behind the Eliminate Single Use Pledge, which launched on the 28 May 2019. 17 Partners have pledged to reduce single use items in their businesses, and have been joined by an additional 38 businesses from different sectors across the city.

The Partnership website was launched providing a central repository for information and resources on best practice environmental management relevant to the sector.

| Performance                   | 2017-18 Baseline | 2020-21 Target        |
|-------------------------------|------------------|-----------------------|
| Carbon emissions (tonnes CO2) | 242,657          | 10 per cent reduction |
| Potable water KI              | 2,102,000        | Zero increase         |

### Relevant links

- [Sustainable Destination Partnership](#)

## COMMUNITY & BUSINESS - PROGRAM UPDATE

### Environmental Grants

Environmental initiatives are supported by the following five grant programs:

- Environmental Performance: Innovation
- Environmental Performance: Building Operations
- Environmental Performance: Ratings and Assessments
- Knowledge Exchange
- Matching

36 awarded in 2018/19 round 3:

- 1 Building Operations project to install sub water metres in seven buildings to combat increasing water usage across the complex.
- 31 Ratings & Assessments
- 4 innovation

15 awarded in 2019/20 round 1:

- 4 innovation
- 11 Ratings & Assessments

These programs facilitate action and catalyse the solutions that will be required to deliver Sustainable Sydney 2030.

In the second half of 2018 and early 2019, 56 grants were approved by Council: 51 Environmental Performance grants; 1 Matching grants and 4 Knowledge Exchange Sponsorships.

Of the 51 Environmental Performance Grants approved by Council, this includes support for 42 Ratings and Assessments projects to assist building owners and managers better understand their environmental impact and to identify opportunities for improvement, 1 Building Operations project to assist building owners track water consumption through the installation of a water monitoring system, and 8 Innovation projects to develop:

- a feasibility study to implement a scalable, zero-waste, and closed-loop coffee delivery service
- the installation of sensor technology to monitor the effects and performance of an urban farm at 2 Market Street, Sydney.
- a feasibility study to investigate the potential for natural burrowing animals (bioturbators) to be reintroduced into Sydney Harbour to remediate harmful pollutants retained in sediments that enter via stormwater inputs.
- a feasibility study to investigate walkability in Sydney through the mapping of greenery and noise using crowd-sourced data from smartphones
- a project to reduce clothing waste caused by fast fashion by using separation technology to reduce unwanted clothing down to their original fibres ready for reuse in new textiles
- an engagement project to engage and educate hotel guests and staff about saving water, energy and waste
- a pilot project to digitise and control the recycling collective in one central place
- A feasibility study aiming to increase the life and health of 'green walls' by using the wall-bot prototype to seed, weed and maintain the walls.

### Relevant links

- [Environmental Performance Grants](#)
- [Knowledge Exchange Sponsorships](#)
- [Matching Grants](#)



## RESIDENTIAL SECTOR

### Residential Apartment Sustainability Plan

The Residential Apartment Sustainability Plan (RASP) adopted by Council in August 2015 contains 30 actions to drive demand for better performing buildings over a ten year period.

The City has continued to collaborate with 18 stakeholders from the NSW State Government, industry and community organisations to reduce the environmental impact of apartment buildings through our Residential Apartments Sustainability Reference Group. This group met in August, November, February and May to discuss opportunities and collaboration around improving sustainability in the strata sector; particular focus has been on the implications of changes to the National Construction Code in the residential sector and early NABERS rating uptake.

Following the launch of the NABERS tool for residential apartment buildings in June 2018, the City is supporting the take-up of this tool through Smart Green Apartments. The City has directly supported 50 ratings (either individual strata buildings or layered schemes in precincts). The ratings are on a scale from 0 stars (poor) to 6 stars (market leading).

Four Leadership Network workshops were held with 54 participants representing 50 buildings from the Smart Green Apartments alumni. Workshops focused on incorporating efficiency upgrades into Capital Works Fund Plans, water efficiency and fast-tracking decision making in strata.

The City has designed a Residential Building Manager Training series with the NABERS team and Green Strata. The training program is intended to provide a national platform for the professional development of residential building managers utilising NABERS as the core framework for improved building performance and governance. The City's second Building Manager Training program commenced in March 2019 delivered with Lendlease in Barangaroo. This series will be delivered in five, four-hour sessions. The first three sessions have been delivered; Fundamentals for Sustainability and NABERS and Energy Management Basics (31 attendees); Managing Energy in a NABERS World - Part 1 (33 attendees) and Managing Energy in a NABERS World Part 2 (30 attendees).

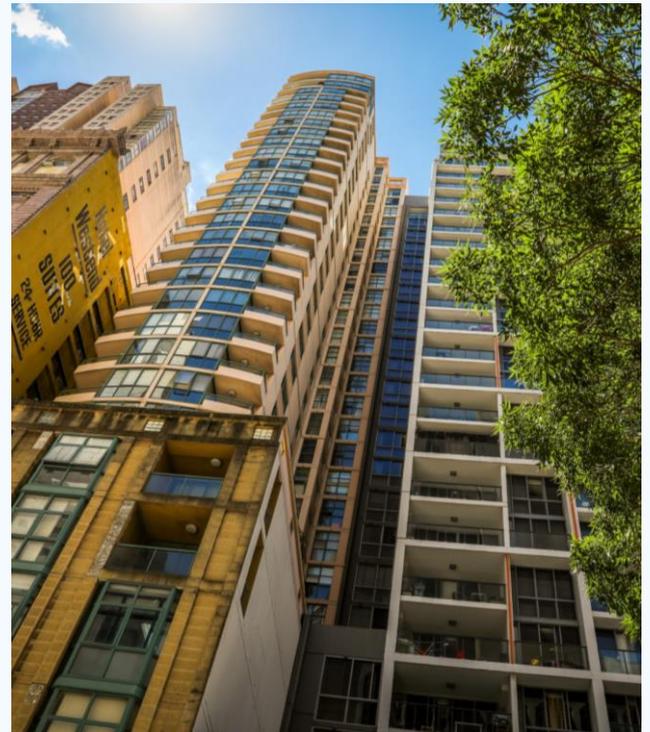
The City promoted the value of improved environmental performance and sustainability upgrades in residential strata through presentations at the following:

- FMA National Conference Sydney
- Strata Community Australia Annual Awards Night (City sponsored Environment and Engagement Award)
- Your Strata Property podcast interview
- Sky News television interview on sustainable living (Real Estate Channel)
- University of NSW solar for strata forum.
- Strata Community Association National Conference
- International Research Forum on Multi-owned properties (Cape Town)

### Relevant links

[Residential Apartment Sustainability Plan: 2015](#)

### Smart Green Apartments



Smart Green Apartments is the City's flagship retrofit program for apartment communities. To date, direct engagement has occurred with 106 strata plans, 133 buildings and 22 000 residents in 10 824 homes.

Energy efficiency projects have been implemented in the 2016 and 2017 intake years, avoiding 11 854 tonnes CO<sub>2</sub> per year and saving participating owners corporations a total of \$1.7 million per year.

Through the City's *Waterfix* partnership with Sydney Water; 2226 individual apartments have been retrofitted within 10 buildings. These upgrades will achieve water savings of 211,995 kilo-litres per annum and cost savings to owners of \$400,000 per annum in reduced water bills. Cumulative savings since 2016, now total 423 990 kL.



**RESIDENTIAL SECTOR - PROGRAM UPDATE**

**Green Villages**

The Green Villages brand aims to connect sustainable living content and initiatives to drive and celebrate sustainable city villages.

In Q3 and Q4, four Green Villages talks were delivered at Sydney Park. Topics included composting and worm farming, edible green walls and growing food in small spaces. The talks were attended by 104 participants. Talks were delivered by City Farm with support from the Sustainability Programs Team. Evaluation surveys indicated that 100 per cent of respondents rated the workshop they attended as excellent, very good or good. Follow-up surveys of participants indicated that 95 per cent of respondents have undertaken one or more new actions since attending the talk.

Water wise and waste wise toolkits, a case study on solar PV and a fact sheet on the Energy Savings Scheme were released.

| Performance   | Q3 18/19 | Q4 18/19 | Year to date | 2018/19 target |
|---|----------|----------|--------------|----------------|
| Workshops and forums (#)  | 2        | 2        | 4            | 8              |
| Participants (#)  | 44       | 60       | 173          | 240            |
| Participants implementing (per cent)                                | 100      | 91       | 86           | 85             |
| Participant satisfaction (% rating as excellent, very good or good) | 100      | 100      | 100          | 90             |

**Relevant links**

- [City of Sydney Environmental News](#)



# 11. Glossary

**Active transport:** Involves any physical activity that gets you from one place to another, such as walking and cycling.

**Annual Carbon Inventory:** Internal database developed by the Sustainability Unit summarising annual greenhouse gas emissions from all City of Sydney assets and activities (buildings, street lighting, parks & other) resulting from consumption of electricity, gas and fuel and other sources.

**Arterial transport:** A high-capacity urban road or route.

**BASIX or Building Sustainability Index:** A NSW government index, to rate energy and water efficiency performance of residential buildings, that aims to reduce water consumption and greenhouse gas emissions by 40 per cent compared to pre-BASIX (2004) buildings.

**Biodiversity:** Biological diversity including species richness, ecosystem complexity and genetic variation.

**Business-as-usual:** A projection (e.g. greenhouse gas emission levels) based on the assumption that all existing policy measures remain in place with no new measures introduced.

**Canopy cover:** The proportion of land area occupied by the tree's crown or canopy, or combined canopies, when visualised from directly above. It is often expressed as a percentage of the total area covered.

**Carbon intensity:** Electricity that has a high emissions concentration, or energy intensity, for example coal-fired electricity has a high emissions concentration, or carbon intensity.

**Carbon neutral or net zero emissions:** Balancing the amount of carbon released with an equivalent amount offset by purchasing carbon credits to make up the difference.

**COP21:** The 2015 United Nations Climate Change Conference held in Paris, December 2015 that negotiated the Paris Agreement - a global agreement on the reduction limiting global warming to less than 2°C compared to pre-industrial levels and to drive efforts to limit the temperature increase even further to 1.5°C.

**C40 Cities:** is a network of the world's megacities committed to addressing climate change.

**Dual plumbing:** A plumbing system with two separate pipes supplying potable and reclaimed water to a building or precinct.

**Ecosystem:** Animals, plants and microorganisms that live in one place, as well as the environmental conditions that support them.

**Energy efficiency:** Using less energy to achieve the same output.

**Energy storage:** The capture of energy produced at one time for use at a later time.

**Environmental Action 2016 – 2021 Strategy and Action Plan** The strategy and action plan combines the insights and data from environmental master plans and strategies that the City developed between 2008 and 2015. The plan outlines our progress to date, and approach to achieving our bold Sustainable Sydney 2030 targets.

**Environmental Management System (EMS):** is a structured system designed to help manage environmental impacts and improve the environmental performance of the City's operations.

**Environmental Upgrade Agreements:** A NSW government finance mechanism for building owners to access finance for upgrade works of existing buildings that result in energy, water and other environmental savings.

**Greenhouse gas emissions:** Gases that trap heat in the atmosphere. Greenhouse gases from human activities are the most significant driver of observed climate change since the mid-20th century.

**Locally indigenous:** A native plant that is limited to a particular geographic area and often confined to a specific habitat.

**Low-carbon energy:** Electricity produced with lower amounts of carbon dioxide emissions than conventional fossil fuel power generation, such as wind, solar and hydro power.

**Mitigate:** Taking action to reduce impact on the environment, as well as contributions to climate change (in this context).

**National Australian Built Environment Rating System or NABERS:** An Australian government initiative that measures and rates the environmental performance of Australian buildings and tenancies.

**National Greenhouse Accounts (NGA) Factors:** Published by the Department of Climate Change "The National Greenhouse Accounts (NGA) Factors" has been prepared by the Australian Government and is designed for use by companies and individuals to estimate greenhouse gas emissions for reporting under various government programs and for their own purpose.

**Net zero emissions:** Balancing the amount of carbon released with an equivalent amount offset. Usually offsets are through purchasing carbon credits to make up the difference. The best practice approach is to reduce, or avoid, carbon emissions first, then offset any unavoidable emissions.

**Non-potable water:** Water that is not of a quality for drinking and cooking purposes, used for purposes such as laundry, gardening, car washing and cooling towers.

**Paris Pledge for Action:** At COP21 in Paris (December 2015), a group of global cities, regions, companies and investors committed to achieve climate stability, limiting global temperature rise to less than 2°C.

**Performance Planning:** Performance Planning (PP) is a TechnologyOne product that stores measures, projects and targets. Data can be imported or manually entered depending on the source. Managers are responsible for ensuring accuracy of the data. PP also contains Corporate Plan KPI's and projects.

**Potable water:** Treated water that is safe enough for consumption, use in kitchens and bathrooms. Water that is of drinking water quality for use in bathrooms, kitchens and for consumption.

**Raingardens:** Gardens that allow rainwater runoff to be absorbed, providing rainwater for plants and improving water quality in waterways by up to 30 per cent.

**Recycled water:** Former wastewater (sewage) is treated to remove solids and impurities and used for non-potable water needs, rather than discharged into waterways.

**Renewable energy:** Energy from resources which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat.

**Resilience:** The capacity to survive, adapt and grow no matter what kinds of chronic stresses and acute shocks are experienced.

**100 Resilient Cities:** Pioneered by the Rockefeller Foundation (100RC) is dedicated to helping cities around the world become more resilient to the physical, social and economic challenges that are a growing part of the 21st century.

**Scope 1 GREENHOUSE GAS emissions:** Emissions directly occurring "from sources that are owned or controlled by the institution, including: on-campus stationary combustion of fossil fuels; mobile combustion of fossil fuels by institution owned/controlled vehicles; and "fugitive" emissions. Fugitive emissions result from intentional or unintentional releases of greenhouse gases, including the leakage of hydro fluorocarbons from refrigeration and air conditioning equipment".

**Scope 2 GREENHOUSE GAS emissions:** Indirect emissions generated in the production of electricity consumed by the institution. Scope 2 emissions physically occur at the facility where electricity is generated.

**Scope 3 GREENHOUSE GAS emissions:** All the other indirect emissions that are "a consequence of the activities of the institution, but occur from sources not owned or controlled by the institution" such as commuting, air travel for university activities, waste disposal; embodied emissions

from extraction, production, and transportation of purchased goods; outsourced activities; contractor owned- vehicles; and line loss from electricity transmission and distribution".

**Sea level rise:** Long-term increases in the mean sea level due to global warming.

**Sustainability Management and Reporting Tool (SMART):** SMART is a new utilities management system that will manage and record energy and water usage by directly extracting consumption data from relevant authorities.

**STEvE (System for Tracking EVerything Environmental):** STEvE (the System for Tracking EVerything Environmental) is a Utilities Information Monitoring System.

**Stormwater harvesting:** Water from intense rainfall events (stormwater) is captured, cleaned and typically re-used for non-potable purposes.

**Sustainable Sydney 2030:** City of Sydney publication that sets the 2030 vision for the city aligned to the strategic priorities of Green, Global & Connected. Sets the direction, defines the road map and articulates the step changes required to achieving a more sustainable future.

**Swales:** Low, moist or marshy land, naturally landscaped feature or a human-created one, that manages water runoff, filters pollutants and increases rainwater permeation.

The best practice approach is to reduce or avoid carbon emissions first, then offset any unavoidable emissions.

**Trigeneration:** A system providing cooling, power and heating. Electricity is produced locally, the waste heat is used to supply heating and hot water, and converted into cooling via a heat-driven chiller system.

**Urban heat island effect:** Cities are often warmer than rural areas because vegetation is replaced with hard structures, such as pavements and buildings, which absorb and release more heat than the natural landscape.

**Urban renewal areas:** A program of land redevelopment in areas of moderate to high density urban land use.

**Utility corridors:** A passage built underground or aboveground to carry utility lines such as electricity, water and sewerpipes.

**Water efficiency:** Using less water to achieve the same output.

**Water sensitive urban design:** A design approach which integrates the urban water cycle into urban design to reduce environmental degradation and improve aesthetic appeal.

**Wetlands:** A land area saturated with water that forms a distinct ecosystem of aquatic plants that manage water runoff, filter pollutants and increase rainwater permeation.

# 12. Appendix 1: Data management plan



Low-carbon city

| City of Sydney (Operations)            |  |   |
|--|--|---|
| Data type                              | Current Status   | Forward Plan  |
| Electricity                            | <p>Reporting underway from SMART.</p> <p>Electricity currently is reported quarterly in arrears. Data provided by electricity retailers.</p> <p>Daily monitoring occurring at all large electricity using sites (over 100,000 kWh per annum).</p>  | Continue to implement and monitor data through Sustainability Management and Reporting Tool (SMART)   |
| Natural gas                            | Gas data is reported quarterly in arrears. Additionally gas account data (usage) may be estimated in cases where the gas retailer cannot read meters.  | Continue to implement and monitor data through Sustainability Management and Reporting Tool (SMART)   |
| Other sources                          | <p>Emissions sources including flights, taxis, contractor fuel, onsite fuel usage, and refrigerants are added to SMART quarterly.</p> <p>Events data is estimated on previous years' performance.</p>  | Improvement plan priorities include improving contractor reporting templates and consistency in recording staff travel data.  |
| Co/Tri generation and renewable energy | The City is working to improve the measurement and reporting of, trigeneration and solar power generation. Data is estimated based on system size.   | Improvement plan being developed to improve metering and incorporate data into SMART.   |
| Asset Environmental Budget (Emissions) | <p>Asset Environmental Budget (emissions) has been developed based using baseline data from the NCOS report.</p> <p>Estimations for portfolio increases has been based on existing portfolio performance, Project projects for co/trigeneration, MPEP, Solar Photovoltaics program programs have been based on estimations for each program. In addition Ausgrid lighting roll out program has been estimated based on the anticipated delivery program.</p> | The Asset Environmental Budget will be reviewed annually.   |
| Local Government Area (LGA)            |  |   |
| Data type                              | Current Status   | Forward Plan  |
| Electricity                            | <p>CCAP City - reported through the Environmental Sustainability Platform.</p> <p>The electricity distributor has provided community-wide high-voltage electricity data for City of Sydney local government area at a high level. Due to confidentiality clauses, a breakdown of the high-voltage data by source has not been provided and hence is not included in the City's community inventory.</p>  | <p>Continue to monitor and report electricity data.</p> <p>The City is working to get more detailed information on high-voltage electricity consumption and shall include in its inventory if and when it is available.</p> |
| Natural gas                            | CCAP 2.0 reported through the Environmental Sustainability Platform  | Continue to monitor and report  |

|  |  |                                |
|--|--|--------------------------------|
| Other sources                          | CCAP 2.0 reported through the Environmental Sustainability Platform  | Continue to monitor and report |
| Co/tri generation and renewable energy | Information about renewable energy installations is available through the Clean Energy Regulator. The Australian PV Institute have developed a solar map with funding through ARENA at <a href="http://pv-map.apvi.org.au/">http://pv-map.apvi.org.au/</a><br><br>Currently there is no formal mechanism in place for tracking installed co and trigeneration systems. | Continue to monitor and report |



## Water sensitive city

| City of Sydney (Operations)                      |   |  |
|--|---|--|
| Data type  | Current Status  | Forward Plan   |
| Water  | The transition of water data to SMART, the new utility data management system is almost complete. First water utility data set has been released in this report and will be verified in future reports.<br><br>Data is collated from water utility bills. Accruals for June have been calculated based on previous periods. | The organisation-wide sustainable metering program will address key priorities to improve metering and monitoring of water, energy and other sustainability components including recycled water consumption. |
| Annual potable water use by irrigated open space | The irrigated areas are estimates only.<br><br>Latest estimated potable water consumption data from the new SMART system is higher than previously reported.  | Irrigated areas are being verified so the irrigation intensity can be accurately determined.   |

| Local Government Area (LGA) |   |                                |
|-----------------------------|---|--------------------------------|
| Data type                   | Current Status  | Forward Plan                   |
| Water                       | Reporting mains water consumption annually only. No existing process for accurately capturing and reporting non-mains water consumption except manually via IPART for WICA licensees only (annually in arrears).<br><br>Data for LGA potable water usage available annually only. | Continue to monitor and report |



## Zero waste city

| City of Sydney (Operations) |  |   |
|-----------------------------|--|---|
| Data type                   | Current Status   | Forward Plan  |
| Waste                       | Commercial waste and recycling from 65 City of Sydney properties is reported quarterly.<br><br>Construction and demolition waste reporting is limited. | The City has recently completed an organisation wide review into the way in which it collects, reports and verifies recycling and landfill diversion performance data, to significantly improve the accuracy and transparency of our reporting. The City is committed to improved reporting processes and implementing solutions for increased recycling performance of the waste it manages. |
| City managed property waste | All City managed property waste reported from SMART with the exception of aquatic centres.   | Aquatic centres waste data to be incorporated in to SMART   |

| Local Government Area (LGA)                |  |  |
|--|--|--|
| Data type                                  | Current Status   | Forward Plan   |
| Waste                                      | Construction and demolition waste from the city reporting is limited.  | LGA commercial waste data capture to be improved and verified.   |
| Residential waste                          | LGA residential waste data available and reported in the Corporate Plan.<br>Residential and city streets waste tonnages are reported from processor reports and invoices that are extrapolated into local master spreadsheets.   |  |
| City parks, streets and public place waste | City Parks waste tonnages are reported directly from processor reports and invoices.<br>City streets, public place and stormwater waste is not separated for disposal. Separate tonnages are based on estimates from the <i>Operations Waste Databases Audit July 2017</i> . | City parks, streets, public place and stormwater waste tonnages to be reviewed for incorporation into SMART. |
| e-waste                                    | City runs e-waste drop off events tonnage collected is included in the report and also included in the corporate report.   |  |

## Active and connected city

| City of Sydney (Operations) |   |  |
|-----------------------------|---|--|
| Data type                   | Current Status  | Forward Plan   |
| Fleet                       | Provided from the City's data management system Ausfleet.   | Improvement plan to be developed and data to be incorporated into SMART. |
| Cycling                     | Event data, attendance at training sessions and monitoring is collated by City staff and maintained in registers. | Improvement plan to be developed to assess management of data.           |

| Local Government Area (LGA) |  |  |
|-----------------------------|--|--|
| Data type                   | Current Status   | Forward Plan   |
| Car sharing                 | Car share operators provide monthly usage and membership data to the City. Issues with reviewing data due to operator's capacity to plot suburb boundaries, parking areas. Operators do not have common membership categories. Peer to Peer car share membership is not collected by the City.<br>RMS publishes licensing data each quarter.<br>City maintains database of on-street and off-street car share parking using Traffic Committee data and operator reports. | Improvement plan to be developed to assess management of data. |



## Green and cool city

## City of Sydney (Operations)

| Data type           | Current Status                                      | Forward Plan  |
|---------------------|---|---|
| Green and cool city | Organisational reporting currently not centralised. | Improvement plan to be developed to assess management of data |

## Local Government Area (LGA)

| Data type             | Current Status  | Forward Plan   |
|-----------------------|---|--|
| Urban canopy          | Urban canopy measurement is currently undertaken every five years, through the use of Lidar or other high resolution aerial imagery.<br>Tree planting figures are provided through the Corporate Asset Management System (CAMS) | A review of the canopy cover timing will occur as part of the Urban Forest Strategy review.<br>Improvement plan to be developed to assess management of data |
| Urban ecology         | Event data and attendance data is collated by City staff and maintained in registers.<br>Survey data collates as described in the City's Urban Ecology Strategic Action Plan  | Improvement plan to be developed to assess management of data.   |
| Community Empowerment | Event data and attendance data is collated by City staff and maintained in registers  | Improvement plan to be developed to assess management of data.   |
| Green roofs and walls | Green roofs and walls data is collated by City staff and maintained in registers  | Improvement plan to be developed to assess management of data.   |

## Delivering to the Community

## Local Government Area (LGA)

| PROGRAM NAME                        | Current Status   | Forward Plan  |
|-------------------------------------|--|---|
| Better Buildings Partnership        | Program data collated from participants in spreadsheets and uploaded to CCAP 2.0 Environmental Sustainability Platform for archiving and analysis. Details of participants (individual buildings and floor space), energy use and energy savings implemented reported annually in arrears. | Continue to monitor and report  |
| CitySwitch                          | Program data collated in national CitySwitch CRM database for archiving and analysis. Sydney data entered to CCAP 2.0 Environmental Sustainability Platform. Details of participants (individual tenancies and floor space), energy use and NABERS ratings reported annually in arrears.   | Continue to monitor and report  |
| Sustainable Destination Partnership | Program data collated from participants in spreadsheets and uploaded to CCAP 2.0 Environmental Sustainability Platform for archiving and analysis.   | Continue to monitor and report  |
| Smart Green Apartments              | Program data collated in SUMS data platform. Details of participants recorded annually, energy and water use data uploaded monthly and details from assessment reports recorded through phases of assessment process.  | Archiving and analysis to be improved through inclusion in CCAP 2.0 Environmental Sustainability Platform |
| Environmental Grants                | Program data collated in SmartyGrants platform and in program manager spreadsheets. Information recorded as prompted by phases of grant process (application to acquittal).  | Ease of analysis to be improved through inclusion in Programs CRM database                                |

# 13. Appendix 2: Environment Policy

## environment policy

The City of Sydney is the local government authority responsible for the central business district and more than 30 suburbs over 26.15 square kilometres. The City provides services for more than 180,000 residents and 20,000 businesses. On any given day, the local population swells to more than 1 million. Sydney is a vibrant, cosmopolitan city with a diverse population, with people from 186 nations, including one of Australia's largest Aboriginal communities.

The City of Sydney has adopted ambitious greenhouse gas emission reduction targets in response to mounting evidence of a warmer, more unstable climate. These targets can be found at [www.cityofsydney.nsw.gov.au/greenreport](http://www.cityofsydney.nsw.gov.au/greenreport).

All levels of government, the private sector and the community have a vital role to play to ensure that we: stabilise emissions to maintain an acceptable global climate, ensure the city can cope with the impacts of rising sea levels and increased heat and flooding, reduce the unsustainable growth in energy, water and resource demands, prevent pollution and waste to landfill, ensure energy security and minimise impacts of climate threats and pressures from population increase, including on green space and urban ecology objectives.

The City is committed to protecting the environment through: complying with relevant legislation and regulation, complying with relevant government policy commitments and continuous improvement of environmental management processes.

We are prioritising and planning actions needed to prepare the city for the environmental, social, cultural and economic impacts of climate change. These include; a Resilience Strategy for Sydney being developed with the support of the Rockefeller Foundation's 100 Resilient Cities initiative and a Climate Adaptation Strategy to assess and mitigate risks from climate change for the local government area and our own operations.

The objectives shown below are taken from the City of Sydney's *Sustainable Sydney 2030 Community Strategic Plan (2014)*, Direction 2: A Leading Environmental Performer. The Plan is reviewed every four years.

## our commitments

### Objective 2.1

Energy consumption and greenhouse gas emissions are reduced across the local government area.

#### City now

- Reliance on centrally provided energy infrastructure outside the city.
- Legacy in existing buildings, lifestyle and work practices of a high energy consumption era.
- Reasonable level of engagement in property industry regarding the importance of efficient buildings.

#### City in 2030

- Continuous improvement in energy efficiency, energy productivity and greenhouse gas emissions.
- Ultra efficient buildings.
- A growing number of regenerative buildings or precincts that help to improve the carbon footprint of their surrounds.
- Networks of low and zero carbon local energy production and sharing.

### Objective 2.2

Waste from the city is managed as a valuable resource and the environmental impacts of its generation and disposal are minimised.

#### City now

- City focused on diverting residential waste from landfill.

#### City in 2030

- A city that sees waste from all sectors as a valuable resource.
- Waste management practice of all sectors are coordinated to minimise environmental impacts.

### Objective 2.3

Potable water consumption and gross pollutant loads to the catchment are reduced across the local government area.

#### City now

- Water is seen as a cheap, renewable resource.
- Invisible drains that quickly remove water which is treated like waste.

#### City in 2030

- The value of water is properly recognised.
- Potable water use is rationalised and opportunities to replace demand with recycled water are realised.
- The quality of city waterways meet the needs of the community while minimising impact on the environment.

### Objective 2.4

City residents, businesses, building owners, workers and visitors improve their environmental performance.

#### City now

- An urban management practice that focuses on what is easier - new development.
- Leading environmental practice in silos not enabling transformative change.

#### City in 2030

- A community that understands the environmental impact and one that collaborates in the development and implementation of initiatives that improve the environmental performance of the city.
- An urban development norm that means that all new and redeveloped buildings operate with high environmental performance - supported by robust State and local planning policy and standards.

### Objective 2.5

The City of Sydney's operations and activities demonstrate leadership in environmental performance.

#### City now

- A commitment to strategic environmental initiatives

#### City in 2030

- International recognition for environmental leadership across all areas of the City of Sydney activities.

### Objective 2.6

The extent and quality of urban canopy cover, landscaping and city greening is improved.

#### City now

- The city has some tree lined streets and great urban parks.
- Urban canopy is 15.5 per cent of the city area and there is very little remnant vegetation or landscape.
- The City is working with the community to green local streets and spaces.

#### City in 2030

- The City is planting trees into every available road and footpath, and residents and developers are planting large canopy trees on private property.
- The urban canopy has increased and the community are enjoying the financial, social and environmental benefits of their trees.
- The urban heat effect has reduced and there are wildlife corridors linking the city's major parks.
- The city has the highest quality parks and open spaces maintained to best practice standards.
- The community are active participants in protecting and enhancing the city's trees, parks, flora and fauna.



Monica Barone  
Chief Executive Officer April 2015

**LEGEND**

|                          |                                     |
|--------------------------|-------------------------------------|
| <b>CO<sub>2</sub></b>    | Carbon dioxide                      |
| <b>GWh</b>               | Gigawatt hours                      |
| <b>Kg</b>                | Kilogram                            |
| <b>kL</b>                | Kilolitres                          |
| <b>kWp</b>               | Kilowatt peak                       |
| <b>LED</b>               | Light Emitting Diode                |
| <b>LGA</b>               | Local Government Area               |
| <b>m<sup>2</sup></b>     | Square meters                       |
| <b>ML</b>                | Megalitres                          |
| <b>MWh</b>               | Megawatt hour                       |
| <b>MWe</b>               | Megawatt equivalent                 |
| <b>t</b>                 | Tonne                               |
| <b>tCO<sub>2</sub>-e</b> | Tonnes of carbon dioxide equivalent |

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